THE COMPLEAT ART OF DYALLING.

Plainly demonstrating, out of the Sphere, how to project both great and small circles, upon any Plane whatsoever: with a new Conceit of reflecting the Sunne beames upon a Diall, contrived on a Plane, which the direct beames can never shine upon.

TOGETHER

VVith the manner of cutting, the five Regular Platonicall bodies; and two other, the one of 12, the other of 30 Rhombes, never discovered heretofore; also the finding of their *Declinations, and Reclinations, and adorning them with variety of Dials.*

All performed, by the Doctrine of Triangles; and for ease, and delight sake by helpe of the late invented, and worthily admired Numbers, called by the first Inventor, *Logarithmes.*

By *I. Wells* of *Deptfort*, Esquire.

LONDON,

Printed by THOMAS HARPER, for *Nicholas Fussell*, and are to be sold in *Pauls*-Church-yard at the signe of the white Lyon and Ball, 1637.

HENRY GELLIBRAND

TO THE LOVER OF the *Mathematiques*.

SHADOWES are defined by our * Masters of the *Optiques*, to be but *Imminutions of Light caused by the Interceptions of Opacous bodies.* Whose subtile entitie, hath mooved [so]me *great* * *Geometers*, to assimilate [th]em unto a *Superficies*, and tearme [th]em Ἐπιφάνειαι, that is to say, *Ap[pa]rences.* Neverthelesse it hath plea[se]d the *Fountaine of all Wisdome*, to bound [ev]en these *Shadowes* with *Precepts*, and [ra]nge them within the *societie of Arts.* [N]either stands this *Art of shadowes* in a[n]y *darke or inferiour Place*; for by them

* *Vitello. Risnerus.*

* *Apollonius. P. Ramus.*

are we led on to many *rare and sublime*
speculations. It is from *Shadowes* wee ar-
gue the cause of *Eclipses*, their *Quantiti*
and Qualitie; The *Magnitudes* of the *Lu-*
minaries and their *Altitudes*; From the
we obtaine the *Longitudes and Latitud*
of Places; distinguish the *Zones*, *Clim*
and Paralels; They first taught us t
Sphericall Figure of the *Earth*, its *Mag*
tude, *and Disproportion* to the vast V
verse; To these are our best *Painters*
debted for the Life and Grace of th
choicest *Pieces*; And to these (if we may
leeve *Ptolemy*) are the mutable con
ons of *Men*, *Kingdomes*, *and Com*
wealths imputed. In a word, it is
Art of Shadowes which rectifieth our
count of Time, not after that Rust
hungry way of a gratefull decupled
dow, (the time of an approching sup
but by a certaine and demonstrativ
stinction thereof. For though the
cients, who spun long threads of lif
scarce any further respect to the p
the day, than the *Morning*, *Noone*

w

vening ; Yet as the ſtocke of life after ſome few *Ages* began to ſpend, ſo they likewiſe to attend a more ſerious & prudent expence thereof, and to diſcriminate the day into ſmaller particles. Now because among the heavenly bodies, that bright Lampe of the VVorld, is the *Principall Meaſurer of Time*, and the *Eye* alone not able by thoſe variable altitudes, to diſtinguiſh its *Diurnall archs* into ſmaller portions, therefore have ſome deepe and witty *Artiſts* taught the Sunne to trace out his way upon the Earth, and by the ſhadow of an *Axis* to marke out thoſe leſſe parts of the day unto us. The firſt *Gnomonicall Organ*, which ſtands upon Record, is the *Diall* of King* *Ahaz* (wherby the Almighty was pleaſed to expreſſe a miracle for the recovery of King *Hezekiah*, and moved the *Babylonian Ambaſſadours* to inquire of the *wonder* that was done in the Land) which whether it were a *Convex or Concave Hemiſphere*, (as moſt genuine and naturall, and afterwards familiar among the *Chaldeans*) is yet left

* 2. *King*. 20. 11.

Eſay 38.8.
2. *Chron*. 32. 31.

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scarce any further respect to the p
the day, than the *Morning*, *Noone*

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[illegible] among the (*Chaldeans*) is yet left

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ſpeculations. It is from *Shadowes* wee ar
gue the cauſe of *Eclipſes*, their *Quantit*
and Qualitie; The *Magnitudes* of the *Lu*
minaries and their *Altitudes*; From the
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* 2. *King*. 20. 11.

Eſay 38.8.
2. *Chron*. 32. 31.

undecided. Yet some there are, wh
crowne *Anaximenes the Lacedemonia*
therwith, as first giving breath to the Sc
oteriques. It crept into *Rome* later, as mor
addicted to the Discipline of the Fiel
then of the Heavens, contenting them
selves only with the *Rising and Setting*
the Sunne digested into the twelve T
bles; *Accensus* the Consull afterward d
termining the *Noon-tide*, and that only
serene dayes, soone after the *Puni*
warre. And no further light had th
till the *Consul M. Val. Messala*, beautifie
Colume with a Diall neere the *Rostr*
saith *Varro*. The *excavated Hemisphe*
is attributed to *Berosus* the *Chaldæan*,
ter the taking of *Catana in Sicilie*. Oth
voice it on that witty *Samian Aristarch*
(to whom *Copernicus* is indebted for
Heroicke Hypothesis of the Earths Mot
as first shadowing out the houre lines
a Plane. Yet sure *the Scaphe or Conca*
Hemisphere was in use before him;
Eratosthenes is well knowne to have
termined thereby, some *Celestiall and T*

restri

restriall distances. But what the *Superficies* was, or who the prime Inventer in those Cloudy Times, is not much materiall. This we know, that for the complement of this Art two of the most Divine must descend from Heaven to consult thereon; the *One* conferring *lines*, that other the *Substile motion of the Sunne.* The *Surveyour* may search out *Altitudes*, *Longitudes, and Latitudes*; The *Military Architect* fabricate his *Fort*; The *Enginer* plant his *Canon*, *Convey* his *Myne*, by the only helpe of *three right Lines*; But the compleat *Shadowist* cannot here rest without further helpe from above. For besides his skill in the *Spheriques*, together with the Lawes of that greater Luminaries motion, he must be absolute in all its *Circular Affections*, as *Declinations*, *Right and Oblique Ascentions*, *Altitudes*, *Amplitudes*, *Azimuthes*, *Culminations*, *Arches Diurnall*, *Ascendent*, *Descendent*, *&c.* Truly the light is sweet, and a pleasant thing it is for the Eyes to behold the Sunne, (as the VVise *Ecclesi.* 11.7 man saith) how much more when accom-

companied with such varietie of dispar-
titions. Neither resteth it here only,
though affording a seat of sufficient con-
tentment, but proceeds to a further bene-
fit in humane affaires. What more inva-
luable than *Time*? we having nought to
boast of but only its possession, and that
more momentany than the fleeting Sha-
dow it selfe; the *Future* houre is no more
mine than the *Precedent*, only *Hope* (
weake staffe whereon we too much rest
makes me Lord of it, & yet out of which
every small casualtie can expell me. He
then is the *good Steward* that well im-
proves it, and the better in being jogg
on by a frequent Remembrancer, which
this mute Monitor faithfully performe

Here have we then by this *learned A-
thour*, the art of numbring Time by Sha-
dowes, after the most *Methodicall*, *Com-
pendious and Perspicuous* manner com-
pleatly and *demonstratively* delivered f
all *Planes*, both by *Lines and Numbers*.
The worth of the worke will be best va-
lued by those, who after much wandri

ha

have at length sate downe wearied, with the obscure and toylsome *Labyrinths* of others. There can be found no neerer path then that which leads in the shortest extension; this I suppose to sute best with Pilgrims, who have long wayes and short lives; It will become those that enter the same, to reverence the *Finger directive*, and blesse *God, the Father of Lights*, from whom every good gift descends.

London, Gresham Colledge,

Iune 6. 1635.

THE AVTHOR TO THE READER.

THis tract of Dyalling wa written for mine own private delight and exer- cise, above thirteen yeeres since, as divers my friends know: wher in I have beene the more curious, to han every kind of Plane; not with any though or purpose, ever to print the same, bu keepe it by me, for satisfaction to my sel and friends whensoever there should b cause to use it. Yet shortly after the Wor was finished, occasion to make use of it, dr on occasion for my friends to take notic thereof: amongst the rest, my two late w thy friends, Master Henry Briggs, (in

sti

ſtiled by a Reverend Divine our English Archimedes *) and Maſter* Edmund Gunter, Aſtronomie Lecturer of Greſham Colledge, *deſired to peruſe it; and finding that the Arithmeticall part was performed by Logarithmes of both kinds, and therefore might ſerve inſtead of uſes for the Chiliads and Canon, compiled by them; did earneſtly ſollicite mee to print the ſame: but they both dying, this motion of theirs died with them.*

Of late it hath beene againe revived, by the requeſt of other Friends; but eſpecially by the encouragement of my much reſpected, and learned Friend Maſter Henry Gellibrand, *who hath annexed his approbation of that, which in my owne opinion I never thought worthy of ſo much eſteeme. I have therefore at length (yeelding to the importunitie of Friends) conſented to let it paſſe to the publike view. If any benefit grow from it, let him have the honour, that is the Authour of all good gifts, and let my Friends ſhare in the thankes, that have in a manner extorted it out of my hands.*

I have prefixed an Index *of the principall matters, contained in the whole Booke, diſtinguiſhed into Chapters, with the faults eſcaped therein; to the end, that*

bee

hee that will not take the paines to read all over, may fix upon those Chapters that will serve his turne, and correct the faults of them before he begin to read. Many more no doubt have escaped, the rather because I could not attend the Presse my selfe, which you may mend as you meet with them, and beare with the common frailty of all Mankind.

J. W.

AN INDEX OF THE PRINCIPALL MATTERS OF THIS Booke, with the faults escaped therein.

Chap. I.

Faults escaped in this Chapter.

2 lin. 35. 34630. for 34730. the sine of 10 d. doubled.

Chap. II.

Faults escaped in this Chapter.

8 C omitted in the third Diagram.
10 lin. 33. 90 d. for 60 d.
11 lin. 20 The line left out betweene the Sun and differ: of the Logarithmes.
28 the for these.
16 lin. 25 (the sine of) superfluous, to be stroke out.
17 lin. 7 & 28 Arith. complement twice omitted.
19 lin. 2.3.4. the 3 Angles A B C, should have beene set a part and all summed up together.

Chap. III.

Faults escaped in this Chapter.

21.lin.28. (two) for second.
22.lin.30. The line betweene the 2 last Logarithmes left out.
31.lin.20. Sides for side.
32.lin.20. ♋ must be stroke out as superfluous.
34 In the first Diagram, O for P.
43.lin. 2. given, for sought.
Lin. 3. sought for given.
44 In the 2 Diagram, P in the place of S, & S in the place of P.
47.lin.11. P Z S, for Z P S.
51.lin. 5. R Z S for R Z P.

Chap. IV.

Faults

Faults escaped in this Chapter.

Pag.			
58	lin.	36	be for by, and with for which.
60	lin.	2	Poles for Pole.
62	lin.	16	90 d. 46′. for 70 d. 46′.
64	lin.	6	Cordinall, for Cardinall.
65	lin.	21	Sines for lines.

Chap. V.

Faults escaped in this Chapter.

65	lin.	26	steight for streight.
69	lin.	23	20 for Z O.
71	lin.	27	Substice for substile.
73	lin.	12	vertix for vertex.

Chap. VI.

Faults escaped in this Chapter.

5 lin. 3 (the) left out.
lin. 12 (The Arithmeticall calculation) should have been in great letters set apart.

The Contents.

pag.			
76	lin.	8	is for are, and distance for distant.
77	lin.	33	1893 for 9893.
78	lin.	28	(and the face) is superfluous to be stroke out.
80	lin.	11	fitted for fittest.
83	lin.	7	S P for Z P.
84	lin.	13	difference for differences.
85	lin.	10	Semidiameters, for Semidiameter. Againe, lin. 2 & 25.
	lin.	26	15 d. for 51 d.
	lin.	29	put for puts.

Chap. VII.

Faults escaped in this Chapter.

89	lin.	14	(first) left out.
91	lin.	3	S for E.

Chap. VIII.

Faults escaped in this Chapter.

92 lin. 26 Plane for plaine.
94 lin. 12 the first 39 d. 54′. superfluous to be stroke out.
lin. 16 returning for returneth.
lin. 17 on for off.
lin. 32 but for out.

Chap. IX.

Faults escaped in this Chapter.

8 lin. 28 Arithmeticall complement left out.
31 0,19 for 0,07.
1 lin. each : for the East.

Chap. X.

The first part.

Faults escaped in this Chapter.

105 lin. 23 R Z for Q Z.
106 lin. 2 lines for line.
21 (the) left out.
108 lin. 10 *and 11 South part, should be West part, and N part, East part of the Plane.*
25 A x for H x.

The Contents.

Chap. X.

The second part.

The Contents.

Faults escaped in this Chapter.

114 lin. 3 the word (degree) is superfluous, and mu stroke out.
11 fift case, for the ninth case.
115 lin. 31 Houres distance, for houre distances.
116 lin. 28 (for 3 of clocke) superfluous, and must be st out.
118 lin. 22 appeares for appeare.

Chap. XI.

Faults escaped in this Chapter.

127 lin. 8 the for that.
129 lin. 11 $\frac{68}{100}$ parts for $\frac{86}{100}$.
22 Arith. complement superfluous to be stroke out.

Chap. XII.

Faults

Faults escaped in this Chapter.

133 lin. 8 Z 3 for Z O.
134 lin. 31 two for second.
135 lin. 7 two againe for second.
136 lin. 26 P R 8 for R P 8.

Chap. XIII.

Faults escaped in this Chapter.

147 lin. 2 South reclining 23 d. for 25 d.
150 lin. 25 being for bring.
153 lin. 1 (is 64 d. 10′.) left out.
156 in the Scheme 65 d. 31′. should be 65 d. 40′.
157 lin. 10 differences left out.

Chap. XIV.

Faults escaped in this Chapter.

160 lin. 8 sixteene halfe houres; for sixteene houres a[nd]
halfe.
162 lin. 1 The *data*, and *quæsita* of this Diall, should h[ave]
beene placed before the Arith. calculation.
34 The 34 Chapter should be the 35.
167 lin. 4 The 34 Chapter againe for the 35.

Chap. XV.

Faults escaped in this Chapter.

171 lin. 3 ND for NP.
174 lin. 9 Houres distances for houre.

Chap. XVI.

Faults escaped in this Chapter.

176 lin. 7 Pole for Plane.
178 lin. 26 is for to.
29 triangle for triangles.
179 lin. 5 The unitie in the first place should be cancelled, and the line betweene the first and second Logarithmes left out.
181 lin. 23. 26 product for produce twice.
183 lin. 7 directed for erected.

Chap. XVII.

Faults escaped in this Chapter.

187 lin. 15 fift case for fifteenth.
189 lin. 15 and 18. Logarithmeticall for Logarithmicall.
192 lin. 8 Diall for a Diall.

Chap. XVIII.

Faults escaped in this Chapter.

199 lin. 5 and 6, Logarithmeticall for Logarithmicall.
13 R P S for R P 5.
24 widest for wideth.

Chap. XIX.

Faults escaped in this Chapter.

05 lin. 2 Complement of the Tangent left out.
07 lin. 15 Logarithmeticall for Logarithmicall.

Chap.

Chap. XX.

Faults escaped in this Chapter.

209 lin. 21 34 Chapter for 35.
214 lin. 23.27.29. Logarithmeticall for Logarithmicall thr times.
216 lin. 21 (the) left out.
217 lin. 5 (done) left out.

Chap. XXI.

Faults escaped in this Chapter.

219 lin. 8 recliner for incliner.

The Contents.

Chap. XXII.

Faults escaped in this Chapter.

22 lin. 10 incliner for decliner.
11 deducted for deduced.
24 lin. 20 recliners for recliner.
25 lin. 10 28 d. 38′. for 38 d. 28′.
26 lin. 16 (the) omitted.
27 lin. 3 South declining East 60 d. inclining 16 d. should have stood under the Scheme.

Chap. XXIII.

The Contents.

Faults escaped in this Chapter.

231	lin.	19	whereon : for whereout.
233	lin.	1	angle for angles.
238	lin.	13	whereon for whereout, and (the) omitted.
239	lin.	1	(of) is superfluous.
243	lin.	18	whereon for whereout.
245	lin.	13	widest for width.
		16	angled for the angle d.
		25	d for e.
248	lin.	11	rule for rules.

Chap. XXIV.

Faults escaped in this Chapter.

250 lin. 18 a e h for a e h I.
251 In the paralellipiped a d h should be a n h.
lin. 21 decline for recline.
252 lin. 7 S for P.
255 lin. 5 widest for width.
257 lin. 10 from the 10 line to the 17, a little f mista
for a great F nine times.
258 lin. 13 a little f for a great F.
260 lin. 21 56 d. 16'. 57''. for 58 d. 16'. 57''.
261 lin. 22 68. 16. 57. for 58. 16. 57.

Chap. XXV.

Faults escaped in this Chapter.

267 lin. 4 (the) superfluous.
268 lin. 4 widest for width.

Chap. XXVI.

Faults escaped in this Chapter.

269 lin. 18 S. for I. and 0407. for 0407.
22 widest for width.
33 A little f twice for a great F, and a little e, for a great E.
270 lin. 5 A great B for a little b.

Chap. XXVII.

Faults escaped in this Chapter.

271	lin.	20	or for of.
272	lin.	10 & 23	widest twice for width.
277	lin.	25	Signes for Sines.
		27	(of G C H, B C H, K C H, and L C H, to the lines H G, H B, H I C, and H L, the distance of those paralels from the Center) all left out in printing.
		28	*Logar.* superfluous, and must be stroke out.
278	lin.	2	widest for width.
		18	0098.61 *for* 0098.51.
281	lin.	1	West for and.
		19	widest for width.
285	lin.	15	*Characteristica* for *characteristicall.*
286	lin.	10	widest for width.
289	lin.	8	widest for width.
290	lin.	11	*Cosine* left out.

Chap. XXVIII.

Chap. XXIX.

Faults escaped in this Chapter.

295 lin. 12 22*d. for* 225*d.*

Chap. XXX.

The Contents.

Chap. XXXI.

Faults escaped in this Chapter.

300 lin. 4 Azimuth for Azimuths.
10 widest for width.
24 *60* p. (p) omitted.
301 lin. 15 widest for width.
302 lin. 25 widests for widths.

Chap. XXXII.

Faults escaped in this Chapter.

03 lin. 30 (and) is left out.
04 lin. 28 FG is left out.
07 lin. 22 widest for width.
09 lin. 15 widest for width.
36 (the) is left out.
12 lin. 11 The characteriske of 1 for 0.
14 widest for width.

Chap. XXXIII.

Faults escaped in this Chapter.

313 lin. 24 Pole for Poles, and omitted for united.
314 lin. 24 28 d. 38′. for 38 d. 28′.
32 S R I for S R the I superfluous.
317 lin. 11 38 d. 28′. for 38 d. 20′.
318 lin. 7 signe + more for the signe — lesse.
380 lin. 13 Logarithmeticall for Logarithmicall.
384 lin. 16 (the) omitted.
32 Logarithmeticall for Logarithmicall.
385 lin. 15.29 Logarithmeticall for Logarithmicall twic[e]

Chap. XXXIV.

Faults escaped in this Chapter.

386 lin. 4 *Scoubergius* for *Scoubergerus*.
387 lin. 3 C D B for G D B.

The Contents.

Chap. XXXV.

Faults escaped in this Chapter.

392	lin.	19	(*Case*) is superfluous, to be stroke out.
395	lin.	28	P D ♈ for P D R.
		33	and for or.
398	lin.	12	*pag.* 138 should be 148.
399	lin.	11	part for plane.
403	lin.	21	length for heigth.
410	lin.	20	paral for paralell.
		30	P for Pole.
		35	by the case should be by the sixt case.

CHAP. XXXVI.

The Contents.

Faults escaped in this Chapter.

5 lin. 7 (and) superfluous,

8 lin. 21 (from) omitted.

Septe

Octobe

Nove

Decem

		Sun rise H.	'	Sun set. H.	'	Length of day. H.	'	Length of night. H.	'	Breake of day. H.	'	Twilight H.	'
eptem:	5	5	44	6	16	12	32	11	28	3	42	8	18
	10	5	54	6	6	12	12	11	48	3	54	8	6
	15	6	4	5	56	11	52	12	8	4	6	7	54
	20	6	14	5	46	11	32	12	28	4	17	7	43
	25	6	24	5	36	11	12	12	48	4	27	7	33
	30	6	33	5	27	10	54	13	6	4	37	7	23
ctober.	5	6	43	5	17	10	34	13	26	4	47	7	13
	10	6	53	5	7	10	14	13	46	4	56	7	4
	15	7	3	4	57	9	54	14	6	5	5	6	55
	20	7	12	4	48	9	36	14	24	5	13	6	47
	25	7	21	4	39	9	18	14	42	5	21	6	39
	30	7	30	4	30	9	0	15	0	5	29	6	31
ovem:	5	7	40	4	20	8	40	15	20	5	37	6	23
	10	7	47	4	13	8	26	15	34	5	42	6	18
	15	7	54	4	6	8	12	15	48	5	47	6	13
	20	8	0	4	0	8	0	16	0	5	52	6	8
	25	8	05	3	55	7	50	16	8	5	56	6	4
	30	8	9	3	51	7	42	16	18	5	59	6	1
ecemb.	5	8	12	3	48	7	36	16	24	6	0	6	0
	10	8	13	3	47	7	34	16	26	6	1	5	59
	15	8	13	3	47	7	34	16	26	6	1	5	59
	20	8	11	3	49	7	38	16	22	6	0	6	0
	25	8	8	3	52	7	44	16	16	5	58	6	2
	30	8	4	3	56	7	52	16	8	5	55	6	5

FINIS.

E
H
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F
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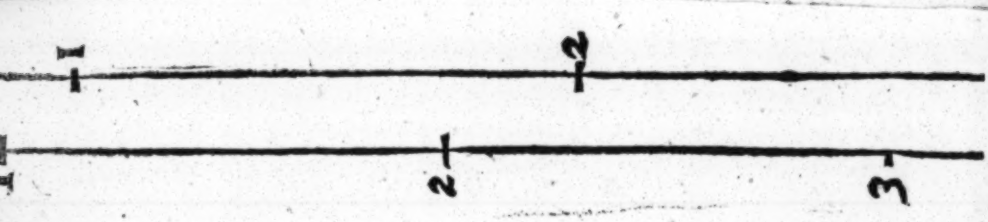
I



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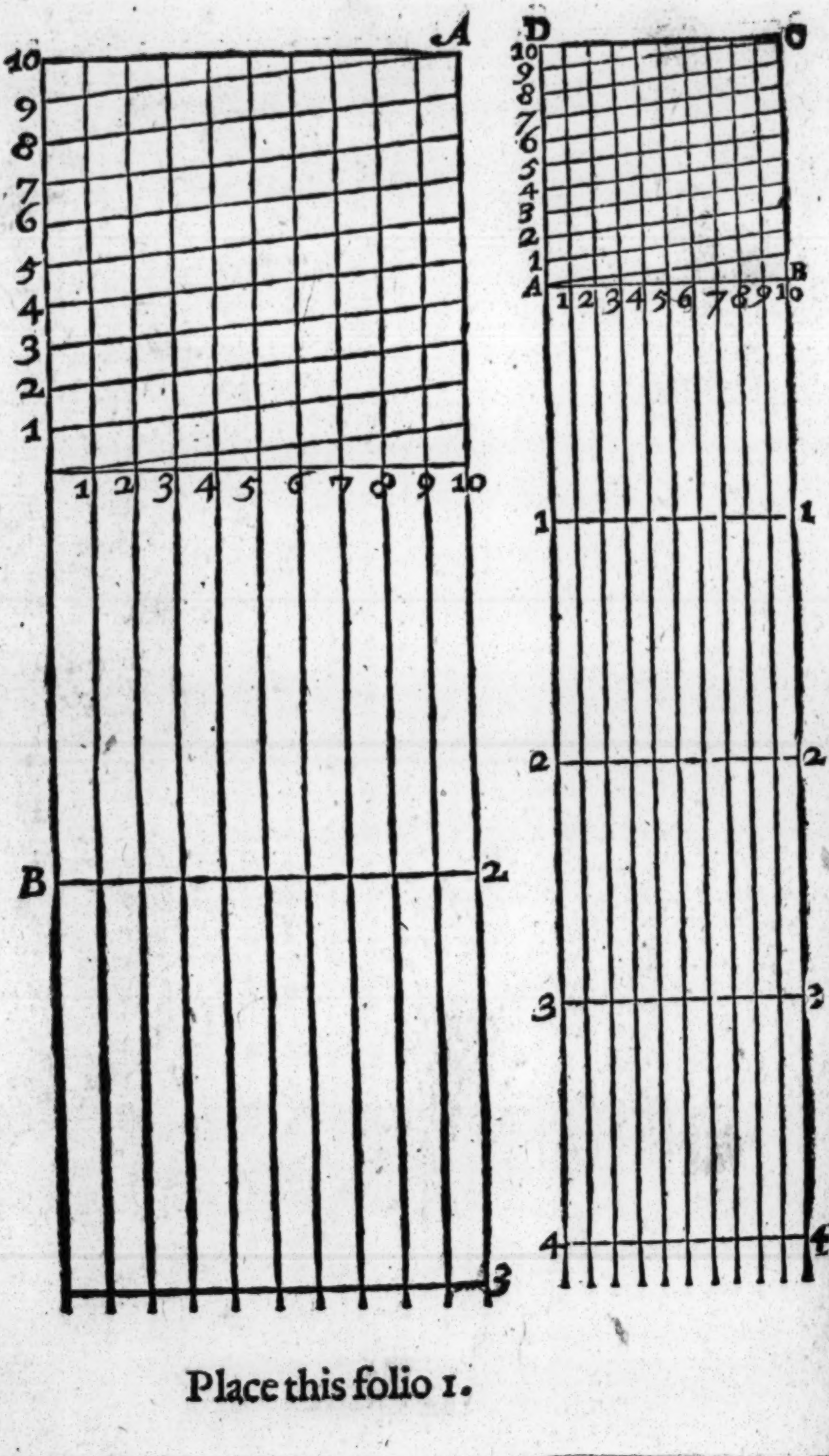


Place this folio 1.

The ART of SHADOVVES, Commonly called DIALLING;

Plainely shewing out of the Sphere, the true ground and reason of making all kinde of DIALS that any Plane is capable of.

CHAP. I.

How to divide divers lines, and make a chord to any proportion [...]*uired.*

BEcause there is continuall use, both of scales and chordes, in drawing the Schemes and Dyals following, it will be necessary first to shew the making of them, that such as cannot have the benefit of the skilfull Artificers labour, may by their owne paines supply that defect.

Draw therefore the straight lines, E 2, & H 3, of what [...]gth you will, let E F, & H G, F I, & G I, or as many [...]re parts as are needfull, be equall to any Radius given, as [...]se are to H O, & L O, of the Dyall in the 11. chapter, (to [...]ich they may be particularly applyed) subdivide E F, & H G, [...] tenne equall parts, and each part againe into halfes, or ra-[...] into tenne parts more, if the lines E F, & H G, will per-[...], so may you of them (as you doe of a Sector) take any part of [...]eight line, or naturall Tangent desired. And note, that [...]eresoever I speake of using the Sector, a line thus divided [...] serve the turne, seeing the line of equall parts thereupon is [...]ly understood in this Treatise, and the opening of the Sector [...]he length of any Radius, is alwaies intended to be betweene [...]. and 100. of those equall parts.

But if you make a paralellogram like unto D 4, G 4, (wh bredth and length is arbitrary, and may be proportioned to Radius given) and divide the bredth therof into ten parts; the first part (equall to the Radius) by diagonall lines into parts, as in the example of A B C D, which is an inch divi each way into ten parts, the work will bee much more ex in imitation thereof, the figure adjoyning A 10, B 2, is fitt the Radius of the fundamentall schem, by help whereof the ces or points of P, B, A, K, and O, proper to the circles pa thorow them, as also the centers of them, and of the hour cles, 8, 7, L, 5, 4, 3, &c which are given in naturall Tang may aptly be found and inscribed.

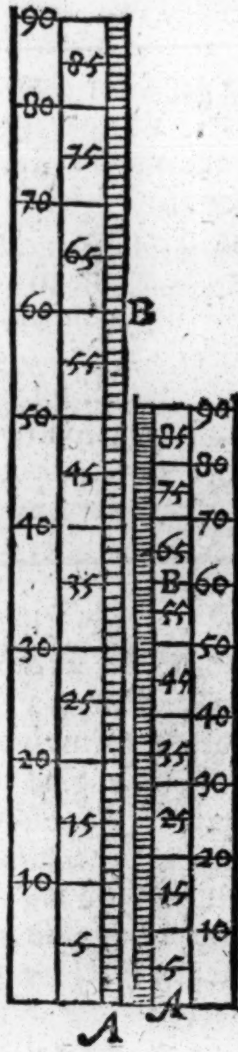
The naturall Sines, Tangents, and Secants, are in every hands, where they are wanting, they may be easily supplie of the artificiall numbers in the end of the book: for if yo the Logarithme of any degree and minute (omitting the racterisk) in the Chiliades, the absolute number answ thereto is the naturall Sine, Tangent, or Secant of the d and minute desired.

d. ′	Log. Sin.	Log. Tang.	Log. Sec.
10. 16	9250.9803.	9257.9901.	10007.0098.
	Nat. Si. 17823.	nat. Tan. 18113	nat. Sec. 101627.

Only remember to take the Logar. of the complement degree and minute desired for the Secant, because the rithmes of the Secants in this table, are turned into the complem. of the Sines, and the characterisk left out, w my privity, which would have served this purpose much without any conversion.

To make therfore the line of chords, prepare a table, the down first the degrees & parts, if you will, from 1 d. proc to 90 d unto each degree joyn the chord proper to it, w the naturall Sine of halfe the arch doubled, by the tenth of of *Finkius*, for if you double the naturall Sines of 5. 10. 20 &c you shall produce the chords of 10. 20. 30. 40 d. So of the Sine of 10 d. doubled, commeth 34730 the chord o and of 25882 the Sine of 15 d. doubled, commeth 517 chord of 30 d. and so of the rest: This done, proportion

Gra.	Chor.	Gra.	Chor.	Gra.	Chor.
1	017	31	534	61	1015
2	035	32	551	62	1030
3	052	33	568	63	1045
4	070	34	585	64	1060
5	087	35	601	65	1074
6	105	36	618	66	1089
7	122	37	635	67	1104
8	139	38	651	68	1118
9	157	39	668	69	1132
[illegible]	175	40	684	70	1147
[illegible]	192	41	700	71	1161
[illegible]	209	42	717	72	1176
[illegible]	226	43	733	73	1190
[illegible]	244	44	749	74	1204
[illegible]	261	45	765	75	1217
[illegible]	278	46	781	76	1231
[illegible]	296	47	797	77	1245
[illegible]	313	48	813	78	1259
[illegible]	330	49	830	79	1273
[illegible]	347	50	845	80	1286
[illegible]	364	51	861	81	1299
[illegible]	382	52	876	82	1312
[illegible]	398	53	892	83	1325
[illegible]	416	54	908	84	1338
[illegible]	432	55	923	85	1351
[illegible]	450	56	939	86	1364
[illegible]	466	57	954	87	1377
[illegible]	484	58	970	88	1389
[illegible]	501	59	984	89	1402
[illegible]	518	60	1000	90	1414



 dius

dius of the fundamentall scheme Z S to what length you
and let A B 60 d. of the lesser chord be equall thereto, supp
to be divided into 100. 1000. or 10000. parts out of the p
lellograme A 10, B 2, fitted to that Radius; or having
ctor, open it in the line of equall parts to the wideth of the
dius, and take of either of them 87. that is so many hun
parts of one tenth for 5 d. & 174 that is one tenth & 74.
dred parts for 10 d. & 261, that is 2 tenths & 61 hun
parts for 15 d. and so of the rest: all which you must trans
into the line A B from A upwards unto 90 d. Having by
meanes first prickt downe every 5 & 10 degree, retur
gaine to the Table, and by the same meanes pricke downe
intermediate degree also: notwithstanding if you like not
so curious, you may safely subdivide every five degrees of
smaller chorde into equall parts, seeing the difference of
degree increasing in so small a forme is insensible. From
ground there followeth an easie way of making one part
line of chordes, if you like to be confined to the scantling
Sector hath for the most part a line of Sines thereupon, let
of the chorde, be equall to 30 d. of the Sines, taken from the
ter. In like proportion 5. 10. 15. 20. 25. 40. & 45 d.
Sines, will be equall to 10. 20. 30. 40. 50. 60. 70. 80. &
of the chorde, without opening the Sector at all: where
you take the severall degrees and parts of the line of Sine
transferre them into the line of chords, and write the
number of the Sine upon the chord, you have done wh
desired: in like manner, if you make a circle whose Radiu
bee equall to 30 d. of the Sines taken from the center, yo
thereupon (by taking ½ the arch of the line of Sines from
center) set any degree of the quadrant as of a chord pr
for the purpose, because the Sine of 30 is to the Radius or
of 60 d. as the Sine of every halfe arch is to the chord of the
By this rule you may likewise supply the want of any
with the help of the scale of inches only: so in the fourth d
of the sixt Chapter, because the semidiameter N C, or C
the circular Plane N I C S agreeth with neither ch
finde the length thereof by the scale of inches, to be 137,
1 inch and 37 hundred parts, wherfore as the Sine of 30

he semidiameter N C 137 so is the Sine of 36 d: 58', halfe the rch SK, to the chord of S K 165, that is 1 inch and 65 hunred parts, next hand, and so of the rest.

The instruments being thus prepared for the Mechanicall part, it followeth next that we lay the foundation for the Arithmeticall work, which consisteth of Triangles both right lined nd sphericall: first therefore of right lined Triangles.

CHAP. II.

f the severall Cases and varieties of right lined Triangles, with diverse cautions to be observed in the practice of them.

THE angles and sides of all sphericall Triangles are measured by the degrees and parts of a great circle, therefore the Canon alone is sufficient for them: but the sides of right lined Triangles are measured by the equall parts of some known scale, and therefore the Chiliades in the lution of them must be joyned with the Canon; notwithanding if you seek the naturall Sines and Tangents answerable the angles given amongst the absolute numbers, and take the garithmes of them, you may resolve the question by the Chilides alone, in the use whereof these cautions may bee obrved.

1 Whereas the Logarithmes in the Chilliades are extended 11 places, and in the Canon but to 8, in the use of both tother you may not exceed the like number of places in each, t more or fewer at your pleasure.

2 The Logarithmes of all numbers greater than an unity, are undant, marked thus +; of all lesse than an unity, are defeive, marked thus –, and are therefore said to bee lesse than noing, because the Logarithme of the unity is made nothing.

3 If the Logarithmes of the three proportionals given, bee l abundants, the first subtracted out of the summe of the sefond and the third, gives the fourth: if the first of the three be efective, the summe of all the three is the fourth: if either of

 the

the middle termes be defective, the summe of the first and defective subtracted out of the third, gives the fourth : If three bee abundant, and yet produce a defective in the fo place, the arithmeticall complement of the characterisk pr to that fourth, shall give the true fraction desired, observin same rules in defectives that are required in abundants.

4 If the three proportionals given bee all absolute num abundant, and the Radius none of them, you may avoyd traction, by changing the Logarithme of the first proporti into its arithmeticall complement;as for 2507.8559, the L rithme of 322, take 7492.1441, and adde all together: but Logarithme of the Radius be one of the middle termes, su ction will be as easie as addition.

5 If you like not to work with numbers of divers na together, you may make all abundants, by supposing the fr ons to bee whole numbers, and changing the characteris cordingly; so have you in the fourth case of obliques, the sides.

A B- 923 } all abundant, { A B-0923 } parts of an inch defe
A C-2033 } whereas they { A C-2033 } 2 inches and parts
B C-2546 } are indeed { B C-2546 } bundant.

6 Many questions proper to the Chilliads are resolved out regard to the characterisk, so that wee may finde the lute number answerable to the Logarithme of the fourth portionall, by changing the characterisk at pleasure, in se Chilliads, every one neerer the truth than other ; for if yo the Logarithme of the side A C in the Triangle A C B third Case following--4445.3862. In the first Chiliad the characterisk of 1, the neerest to it is 1431.3637, giveth 27 tenth parts. In the same Chilliad with the cha risk of 2, is 2444.0448, which giveth 278 hundred par the third Chilliad with the characterisk of 3, is 3445. which giveth 2788 thousand parts. In the 28 Chilliad wi characterisk of 4, is 4445.3862, the number it selfe, wh yeth 27884 ten thousand parts.

7 In distinguishing whole numbers from fractions, I line, by which is signified whatsoever standeth before bee integers, in some cases equall to the Radius, but

which is ſeparated by the line, to bee a part or fraction thereof. So is 0349 in the fourth Chapter a fraction ſignifying 349 thouſand parts of the Radius Z E, but in the number 2866 the figure 2 ſignifieth a line double to the Radius Z E, and 866 ſo many thouſand parts more of a Radius, and ſo in the reſt.

8 Note that though the proportionals be ſet down in the naturall way of Sines and Tangents and their complements, yet the numericall operation both for facility and brevity, is always performed by the artificiall numbers of Logarithms.

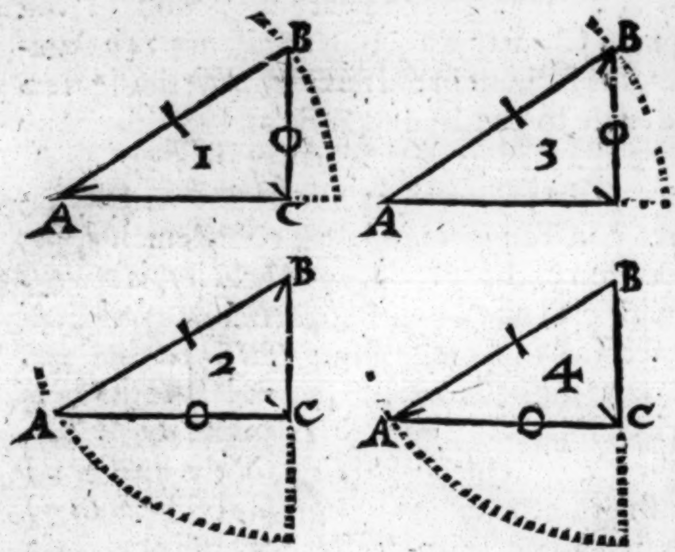
9 Laſtly, the three firſt Caſes following afford you the ſides, the fourth and fift Caſes the baſe, and the ſixt and ſeventh Caſes the angles of any right lined right angled Triangle, as by this mark o upon every variety (which is the ſigne of the *quæſitum*) and by this – the daſh of a pen (which is the ſigne of the *datum*) doth appeare: but in oblique Triangles the ſides and angles are promiſcuouſly found, and the caſes but few, to which I referre you.

Caſe 1. SIDES.

By the baſe and angles, to finde either ſide.

A Triangle conſiſteth of ſix parts, three ſides, and three angles, whereof any three being given, the reſt may be found, only excepting the three angles of a plane Triangle, by which the proportion may bee given, but no ſide can bee found, becauſe the three angles of one Triangle may bee equall to the three angles of another triangle, although their ſides bee altogether unequall.

The Radius, Sine, and complement of any arch: or Radius, Tangent, and Secant of any arch do make a right lined right angled Triangle. Wherefore let the plane Triangle A B C, right angled at C, repreſent the Triangle P L 4 of the fundamentall theme, Chap. 4. right angled at L, *viz.* A B the Radius P 4, C B the Sine of the oppoſite angle or leſſer ſide; L 4 and A C the Sine of the complement or greater ſide P L; or againe let A C repreſent the Radius P L, as in the ſecond caſe, B C the Tangent of the oppoſite angle or leſſer ſide L 4, and A B the Secant thereof P 4, let the baſe A B bee given 322, that is three inches and 22 hundred parts, and the angle at A 30 d, therefore the complement thereof at B 60 d. by the firſt of the ſecond of *Regiomont.*



to find the si
C A or C B
like parts of
base: if you m
A B the Radi
then are C
A C the S
of their oppo
angles A and
as in the t
first varietie
the cosines
them, as in
two second
rieties, when

		Log.
As the Sine of A C B	90 d. 0′	10000.00
Is to the base A B in parts	3220	0507.85
So is the Sine of { B A C or A B C	30 d. 0′	9698.97
	60 d. 0′	9937.53
To the side { C B or C A	1610	10206.82
	2788	10445.38

Againe,

		Log.
As the Sine of A C B	90 d. 0′	10000.00
Is to the base A B	3220	0507.85
So is the cosine of { A B C or B A C	60 d. 0′	9698.97
	30 d. 0′	9937.53
To the side { C B or C A	1610	10206.82
	2788	10445.38

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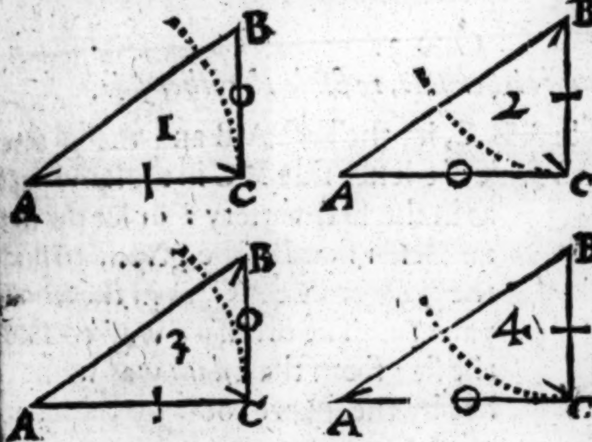
Case 2.

By the angles and either side, to finde the other side.

IN the same Triangle A B C let the greater side A C and the lesser angle at A be given, to finde the lesser side B C; or contrary, to finde the greater side A C. If you make A C in the first, and B C in the second the Radius, then are C B and C A the Tangents of their opposite angles A and B, as in the two first varieties, & the co-tangents of them, in the two later varieties; wherefore,



		Log.
s the Radius A C		10000.00
to C B the tangent of C A B 30 d. 0 m. or Cotangent of C B A 60. d. 0 m.		9761.44
o is the side A C in parts	2788	0445.38
o the side C B in parts	1610	10206. 82

And

		Log.
s the Radius B C		10000.00
to C A the Tangent of C B A 60 d. 0 m. or Cotangent of C A B 30 d. 0 m.		10238.56
o is the side B C in parts	1610	0206.82
o the side A C in parts	2788	10445.38

This Case may bee also resolved by Sines alone, because the des and Sines of the angles are proportionall, and the one acute angle

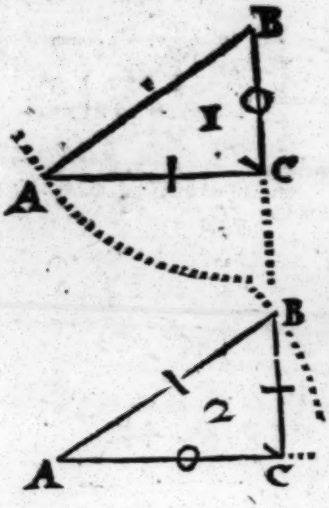
angle is alwayes complement to the other, by the 1 of the
Regiomontanus, wherefore

As the Sine of A B C 60 d. 0'
is to the opposite side A C 2788
So is the Sine of A B C 30 d. 0'
to the opposite side B C 1610
} as in the third variety.

Case 3.

By the base and either side, to finde the other side.

IN the same Triangle A B C, let the base A B and the gre
side A C be given, to finde the lesser side B C in the same
as in the first variety: or let the
and lesser side B C be given, to fi
the greater side A C, as in the sec
variety. The ordinary way to fi
the side from these *data* was wo
bee by the square root, for the sq
of A C taken out of the squa
A B, leaveth the square of B
whose square root is the side B C
sired; but the easier way by Sine
the numbers bee great) is thus
formed at two works, for ma
A B the Radius, A C is the Si
the angle B, as in the first, and
the Sine of the angle A, as in th
cond variety: wherefore



		Log.
As the base A B in parts	3220	0507.8
Is to the side {A C or B C} in parts.	2788	0445.
	1610	0206.8
So is the sine of A C B	90 d. 0'	10000.0
To the sine of A B C	60 d. 0'	9937.5
Or to the sine of B A C	30 d. 0'	9698.9

Secondly having the one angle, the other is comple
thereof in both: wherefore

As the Sine of A C B 90 d. in both			10000.00
Is to the Sine of	B A C in the first	30 d. 0'	9698.97
	and		
	A B C in the second	60 d. 0'	9937.97
So is the side A B in both		3200	0507.85
To the side	B C in the first	1610	10206.82
	and		
	A C in the second	2788	10445.38

You may also performe the same more easily by the Chilliads alone, as in the nineteenth Chapter of Mr. *Brigs* his Arithmet. Logarithm. continuing A B and B A one place further, because A C is 27886 parts.

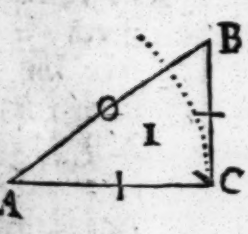
			Log.
The summe of A B and B C is	60086	+	0778.77
The difference of them is	4314	—	0365.12
The sum of their Logarithms is			0413.65
Whose ½ is the side B C required	1610		0206.82

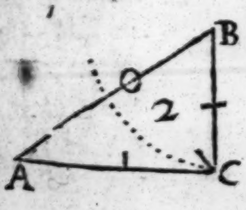
Note the Logarithme of the difference being defective, is subducted.

			Log.
The summe of A B and B C is	4830	+	0683.95
The difference of them is	1610	+	0206.82
The sum of their Logarithms is			0890.77
Whose ½ is of the side A C desired	2788		0445.38

Case 4. BASE.

By both the sides, to finde the base.





IN the same Triangle A B C, let the sides A C and C B bee given, to finde the base A B in the like parts. The ordinary way to finde the base from the *data* was wont to be by the square root, for adding the squares of the two sides A C and B C together, you have the square of the base A B, whose square root is the base desired; but the easier way by Tangents (if the numbers bee great) is thus at two works, as afore: for making A C the Radius, B C is the Tangent

gent of the angle B A C, as in the first variety, and making B the Radius, C A is the Tangent of the angle A B C, as in the se- cond variety, wherefore,

		Log.
As the side A C in parts	2788	0445
Is to the side C B in parts	1610	0206
So is the line A C as Radius		10000
To the line C B as Tangent of the angle C A B	30d. 0'	9761

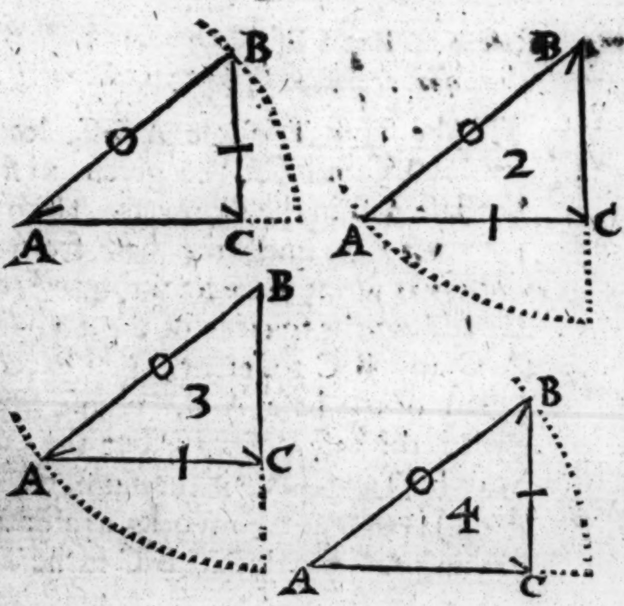
and so of the other variety for A C.

Secondly,

		Log.
As the Sine of C A B or C B A	30d. 0' / 60d. 0'	9698 / 9937
Is to the side C B or C A	1610 / 2788	0206 / 0445
So is A C B the Sine of	90d. 0'	10000
To the base A B	3220	0507

Case 5.

By the angles and either side, to finde the base.



IF one a[ngle] be given, other is given, th[ere]fore in same Tria[ngle] A B C let lesser ang[le] A, and th[e] ser side B given, o[r] the greate[r] gle at B, the greate[r] A C be gi[ven]

or contrary, to finde the base A B in the same parts. If you make A B the Radius, then are the sides B C and A C the Sines of their opposite angles A and B, as in the two first varieties, and the Cosines of them, as in the two second varieties, wherefore

			Log.
As the Sine of	BAC	30d. 0'	9698.97
	or		
	ABC	60d. 0'	9937.83
Is to the side	CB	1610	0206.82
	or		
	CA	2788	0445.38
So is the Sine of	ACB	90d. 0'	10000.00
To the base	AB	3220	0507.85

And againe,

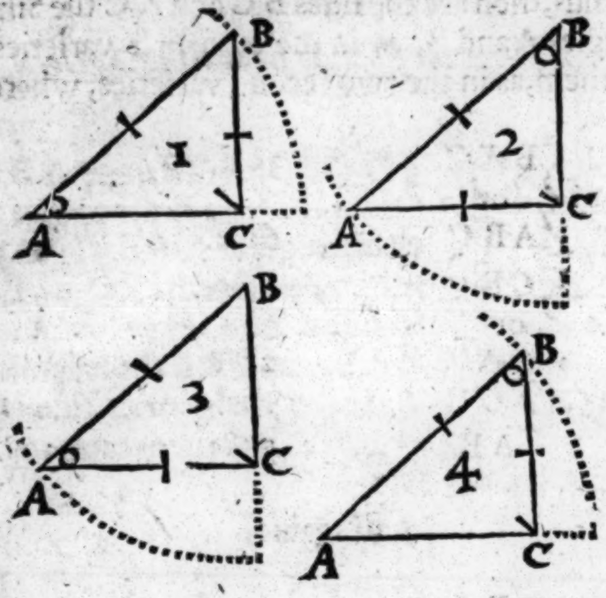
			Log.
As the cosine of	BAC	30d. 0'	9937.53
	or		
	ABC	60d. 0'	9698.97
Is to the side	AC	2788	0445.38
	or		
	BC	1610	0206.82
So is the sine of	ACB	90d. 0'	10000.00
To the base	AB	3220	0507.85

Case 6. ANGLES.

By the base and either side, to finde an angle.

IN the same triangle A B C, let the base A B and the lesser side B C be given, to finde the lesser angle at A; or let the base and greater side A C bee given, to finde the greater angle at B; and contrary. If you make the base A B the Radius, then are the sides B C and A C the sines of the opposite angles A and B, as in the two first varieties, and the cosines of them, as in the two second varieties, wherefore

As



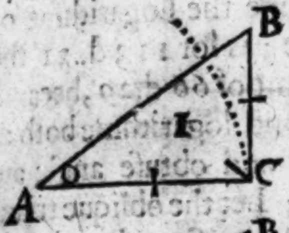
As the base A B		3220	0507.8
Is to the Sine of A C B		90 d. 0′	10000.0
So is the side	B C or	1610	0206.8
	A C	2788	0445.3
To the sine of the angle	B A C or	30 d. 0′	9698.9
	A B C	60 d. 0′	9937.5

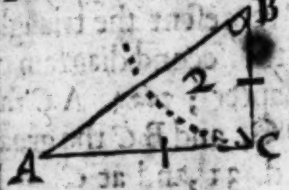
Againe,

			Log.
As the base A B		3220	0507.8
Is to the Sine of A C B		90 d. 0′	10000.0
So is the side	A C or	2788	0445.3
	B C	1610	0206.8
To the cosine of the angle	A B C or	60 d. 0′	9937.5
	B A C	30 d. 0′	9698.9

Case 7.

By both the sides, to finde either angle.





IN the same Triangle A B C, let the sides A *C* and B *C* bee given, to finde either angle at A or B. If you make A *C* the greater side the Radius, B *C* the lesser side is the Tangent of the lesser angle B A *C*, and if B *C* the lesser side be Radius, A *C* the greater side is the Tangent of A B *C* the greater angle: wherfore

		Log.
As the side A *C* in parts	2788	0445.38
Is to the side B *C* in parts	1610	0206.82
So is the side A *C* Radius		10000.00
To the side B *C* as Tangent of the angle B A *C*	30 d. 0′	9761.44

Againe,

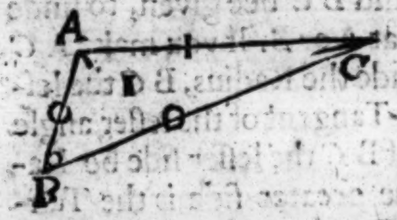
		Log.
As the side B *C* in parts	1610	0206.82
Is to the side A *C* in parts	2788	0445.38
So is the side B *C* Radius		10000.00
To the side A *C* as tangent of the angle A B *C*	60 d. 0′	10238.56

Case 1. OBLIQVE TRIANGLES.

[By] two angles and the side comprehended, to finde the third angle, and the other two sides.

[I]N oblique Triangles there are only foure cases, but many va-[r]ieties, notwithstanding because they come seldome into use in

in this Treatise, and they are already learnedly demonstrated by Mr. *Henry Gellibrand in Trigonometria Britannica*, I will only give example of the *Cases*, and leave the varieties to every mans private practice; Therein is to be noted, that whensoever you deale with an obtuse angle, you must take the Logarithme of the complement thereof to a semicircle; as for 113 d. 31' the Logarithme of 66 d. 29', because the sine and logarithme both of the acute and obtuse angle are the same; Let the oblique triangle A B *C* represent the triangle O B G in the second diagram of the 27 chapter; *vizt.* A *C* the axis of the stile O B, A B the lesser side O G, and B *C* the greater side B G, and let the angles at A 113 d. 31', and at *C* 19 d. 25', and the side A *C* 2033 be given, to finde the angle at B, and the sides A B and B *C*. The angle at B is 47 d. 4', found without calculation, because the three angles of every right lined triangle are equall to two right angles, by the 32 p. 1. b. of *Euclid*, which being known, the sides are found by the 1 p. 2. b. of *Regiomontanus*, because the sides and sines of the opposite angles are proportionall one to the other; wherefore,

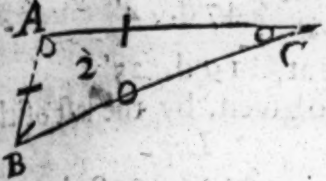


			Log.
As the sine of the angle A B *C*		47 d. 4'	0135.4018. arith. c.
Is to the sine of the side A *C*		2033	3308.1374
So is the sine of the angle	B A *C* or	113 d. 31'.	9962.3428, or 66 d.
	A *C* B	19 d. 25'	9521.7073
To the side	B *C* or	2546	3405.8820
	B A	923	2965.2465.

Case 2.

By any two sides and an angle opposite to one of them, to finde the other side and angles, if the species of the angle sought be known, because the same sine answereth both to the acute and obtuse angle.

In the same triangle A B *C*, let the side A B 923, and



side A C 2033, with the angle A B C 47 d. 4′ opposite thereto be given, to finde the angle A C B, by which the angle B A C is given, and the side B C: whefore

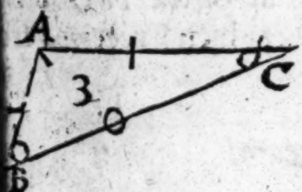
			Log.
the side A C	2033		6691.8625
o the sine of the angle A B C	47 d.	4′	9864.5982
is the side A B	923		2965.2465
the sine of the angle A C B	19 d.	25′	x9521.7072.

herefore B A C 113 d. 31′ the compl. of B and C to 180 d. en is the side B C found by the later axiome of the former e; for

			Log.
he sine of A B C	47 d.	4′	0135.4018 Ar.compl.
o the side A C	2033		3308.1374
s the sine of B A C	113 d.	31′	9962.3428
the side B C	2546		x3405.8820

Case 3.

wo sides and the angles comprehended, to finde the third side, nd other two angles.



IN the same triangle A B C let the side A C 2033, and the side A B 923, and the angle comprehended by them B A C 113 d. 31 bee given, to finde the angles B and C, and the third side B C; wherefore

		Log.
he summe of the sides A B and A C	2956.	6529.2956
the difference of them	1110	3045.3230
the tangent of ½ the summe of the nown angles B & C, which are the plements of the angle A to 180 d,	33 d. 14½	9816.5262
he tangent of the difference f them	13 d. 49′ ½	x9391.1388

 which

which added to the ½ summe, giveth the greater angle at B ——— } 47 d. 4′
and subtracted from it, the lesser angle at C 19 d. 25′
The angles being found, the side is also given, by the last of first Case; wherefore

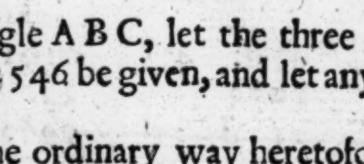
		Log.
As the sine of A B C	47 d. 4′	0135.4018. Ar.
Is to the side A C in parts	2033	3308.1374
So is the sine of B A C	113 d. 31′	9962.3428
To the side B C in parts	2546.	13405.8820

Case 4.

By the three sides, to finde any angle.

IN the same triangle A B C, let the three sides A B 92 2033. and B C 2546 be given, and let any of the angle or C, be required.

In this Case the ordinary way heretofore hath been duce the oblique triangle into two right angled triang raysing or letting fall the perpendicular A D from any (though most commodiously from the greatest) as here whereby the two lesser sides B D and D C of each t A D B and A D C are found, and consequently the angl subtended by them, the complements whereof are the an B and C; but the better way is drawn out of the 18 cha Mr. *Briggs* his *Arithmetica Logarith.* which I receive him many yeeres since.



Out of the Semiperimeter of the three sides, subdu side, so have you the differences; adde the arithmetical plements of the logarith. of the semiperimeter and differ the base, unto the logarithmes of the difference of th halfe the summe of these foure logarithmes, is the logari the tangent of halfe the angle desired.

Three angles.

The base AB	923	A	113 d. 30′ 40″
The sides AC	2033	B	47 d. 4 20″
The sides BC	2546	C	19 d. 25′ 0
The summe	5502		Log.
The halfe summe	2751	6560.5094	Arith.compl.
The differ. of the base	1828	6738.0238	Arith.compl.
The differ. of the sides	718	2856.1244	
	205	2311.7539	
	Totall	18466.4115	
	The halfe T.	9233.2057.	9 d. 42′ ½
		the double	19 d. 25′

Secondly,

The base AC	2033		
The sides AB	923		
The sides BC	2546		
The summe	5502	Log.	
The halfe summe	2751	6560.5094	Arith.compl.
The differ. of the base	718	7143.8756	Arith.compl.
The diffe. of the sides	1828	3261.9762	
	205	2311.7539	
	Totall	19278.1151	
	the halfe T.	9639.0575.	23 d. 32′ 10″
		the double	47 d. 4′ 20″

Thirdly,

The base BC	2546		
The sides AC	2033		
The sides AB	923		
The summe	5502	Log.	
The halfe summe	2751	6560.5094	Arith.compl.
The differ. of the base	205	7688.2461	Arith.compl.
The differ. of the sides	1828	3261.9762	
	718	2856.1244	
	Totall	20366.8561	
	the halfe T.	10183.4280	56 d. 45′ 20″
		the double	113 d. 30 40

CHAP. III.

The severall Cases and varieties of sphericall triangles, with divers cautions to be observed in the practice of them.

1 WHereas in the practice of the Cases I sometimes use but six figures, and the Canon consists of eight, it is left at liberty to use all or some of them, only in cases falling neere the beginning and end of the quadrant, or in resolving the same question by severall cases, except you use all the figures, and take the fourth proportionall as they arise, and fit the Logar. of the sines, cosines, tangents and cotangents unto them, as is done in the table following, the numbers will not agree exactly in all the cases.

2 When the Logarithme of the fourth proportionall exceedeth 9 in the first place, you must cancell the rest, unlesse it produce a Tangent above 45 d. which is greater than the *Radius*.

3 If the *Radius* be one of the middle termes, you may avoid subtraction, by taking the Arith. complement of the Logarithme of the first proportionall for the sine it selfe, and the Logar. tangent of the complement for the tangent it selfe, and adde all three together; notwithstanding because it is easie to subtract the first number out of the summe of the second and third (if the *Radius* be one of them) as to adde all together, I forbeare to use the help of addition; but in cases where the *Radius* is not one of the three proportionals given.

4 All verticall triangles have the sines of the *hypotenuses* and perpendiculars, by the first; the sines of the base and tangents of the perpendiculars, by the 2 axiom of the 4 b. of *Pitiscus*, proportionall, and the angles at their mutuall intersections equall, by the 15 p. of 1 b. of *Euclid*. So may you finde in the first variety of the second case the angle P ♉ ♋ and ♈ ♉ R. or P ♉ ♈, ♋ ♉ R equall, and the like sides of the one triangle ♉ P ♋ proportionall to the like of the other ♉ ♈ R, which will shorten the work in many cases.

5 It may be here again noted, that though the chiliades bee propetly applyed to plane triangles, the Canon to sphericall, yet because every log. canon is made out of the chiliades, the want of a canon may bee supplied by the chiliades, for if you take the Logarith. of the naturall sines and tangents of the sides and angles given, as if they were absolute numbers, the fourth proportionall will be also an absolute number, which found in the table of naturall sines and tangents, resolveth the question without help of the Canon.

6 Because Authours differ in the termes of a R. S. triangle, some calling the side subtending the right angle, the *hypotenusa*, other the base; and the sides including the right angle, the perpendicular and base, other the legs, it is indifferent which be used, so they be not promiscuously taken in the same Case, therein the greatest difficulty is, when to use the sines alone, and when the sines and tangents together: Whensoever therefore you deale with the base and either side including the acute angle, you must work by sines; when with the two sides including the right angle, by sines and tangents together, as in the continuation of the sides will plainly appeare, so have you in the first variety of the first case: as the sine of ♈ ♋, is to the sine of ♋ Æ, so is the sine of ♈ ♉, to the sine of ♉ R: but in the first variety of the fift case: as the sine of ♈ Æ, is to the tangent of Æ ♋, so is the sine of ♈ R, to the tangent of R ♉, and thus of the rest.

7 In R. S. triangles there are sixteen cases and thirty varieties, the first varieties of the first six cases give the lesser sides, the two varieties the greater sides, the seventh, eighth, ninth, and tenth cases the base, the first varieties of the later six cases give the lesser angles, the second varieties the greater, as by the names of the *data* and *quæsita* doth appeare; of each wherof for more plainesse sake, a particular example shall be given.

In the diagram following, P ♋ Æ R ♈, let P represent the North Pole, P ♋ Æ the solstitiall colure, P ♉ R a meridian or great circle passing through the beginning of ♉, let ♈ bee the intersection of the Equator and Ecliptique, ♈ R Æ 90 d. of the Equator, and ♈ ♉ ♋ 90 d. of the Ecliptique.

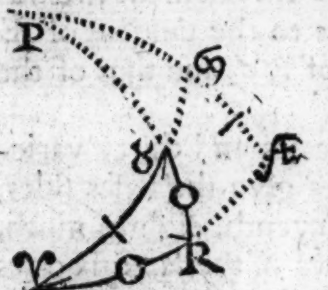
	d ′ ″			
Side	11.30.43 ½.	Si.9300.1052.	Cos.9991.1740	The rall of Tri ♈R
Angle	23.31.30	Si.9601.1352.	Cos.9962.3153	
Sides	27.53.42 ½.	Si.9670.1111.	Cos.9946.3565	
	30. 0. 0	Si.9698.9700.	Cos.9937.5306	
Angle	69.20.35 ⅓.	Si.9971.1413.	Cos.9547.4918	

	d ′ ″		
Side	11.30.43 ½.	T. 9308.9312.	Cot.10691.0688
Angle	23.31.30	T. 9638.8199.	Cot.10361.1801
Sides	27.53.42 ½.	T. 9723.7546.	Cot.10276.2454
	30. 0. 0.	T. 9761.4393.	Cot.10238.5606
Angle	69.20.35 ⅓.	T.10423.6495.	Cot, 9576.3505

Case 1. SIDES.

By the base and angle opposite to the side sought, to finde the side.

IN the triangle adjoyning ♈ R ♉, let the base ♈ ♉ bee 30 d. the distance of the Sunne from the Equinoctiall and let the angle ♈ bee given, measure is Æ ♋, 23 d. 31′ 30″ greatest declination of the Sunne, the right angle at R, alwayes 90 finde the lesser side ♉ R the decli on of the Sunne in the beginning If you continue the sides to quad then the proportion is,



		Lo
As the whole sine ♈ ♋	90 d. 0′ 0″	10000.
Is to the sine ♋ Æ, the measure of the angle ♈	23 d. 31′ 30″	9601.
So is the sine of the base ♈ ♉	30 d. 00′ 00″	9698.
To the sine of the side ♉ R	11 d. 30′ 43″ ½	9300.

The declination of the Sunne in 0 d.

But if you will finde the greater side ♈ R, then instead

ngle at ♈, let the angle at ♉ be given, 69 d. 20′ 35″ ⅓ which is
e angle that the Ecliptique maketh with the great circle paſ-
ng by the declination of the Sun. The ſame Canon reſolveth
e queſtion, without continuation of the ſides, becauſe the
nes of the ſides and oppoſite angles are proportionall, by the
6 of the 4 b. of *Regiomontanus.*

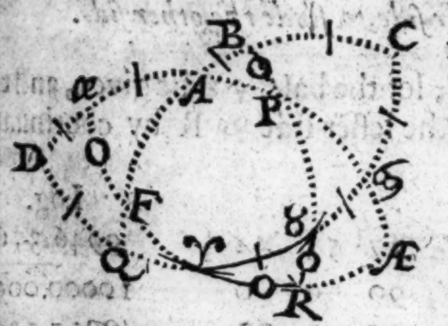
	d			Log.
s the ſine of ♈ R ♉	90	0′	0″	10000.0000
s to the ſine of the baſe ♈ ♉	30	0	0	9698.9700
o is the ſine of the angle ♈ ♉ R	69	20	35 ⅓	9971.1413
o the ſine of the ſide ♈ R	27	53	42 ½	9670.1113

The right aſcenſion of the Sunne in the ſame place.

Caſe 2.

y the baſe and angle adjacent to the ſide ſought, to finde either ſide.

N the ſame triangle ♈ R ♉ let the baſe ♈ ♉ bee given as afore, and the angle at ♉ adjacent to the ſide ſought, to finde the leſſer ſide ♉ R. Becauſe there are not ſufficient *data* in this triangle, continue the ſides unto quadrants, and further if there be cauſe, *vizt.* ♈ ♉ to C, R ♉ to B, and Æ ♋ to A, then will ♋ C be equall to ♈ ♉, C B the meaſure of the angle ♉, A B the complement of that angle, nd B P equall to ♉ R the ſide which is ſought, and ſo in the eſt that follow: wherefore,



	d.			Log.
s the whole ſine A C	90	0′	0″	10000.0000
s to the tang. of C ♋ equall to ♈ ♉	30	0	0	9761.4393
o is A B the coſine of the ang. ♉	69	20	35 ⅓	9547.4918
To the tang. of B P equall to ♉ R	11	30	43 ½	9308.9311

The Suns declination.

Secondly

Secondly, instead of the angle at ♉, let the angle at ♈ bee given, to finde the greater side ♈ R by continuation the o[ther] way: for ♈ ♉ is given, therefore ♈ Q and Q D, also the angl[e] ♈ is given, therefore the measure thereof D œ, and also œ wherefore,

				Log.
As the whole sine A D	90	0′	0″	10000,00
Is to the tangent of D Q equall to the base ♈ ♉	30	0	0	9761,4
So is A œ the cosine of the angle ♈	23	31	30	9962.3
To the tangent of œ F equal to the side ♈ R the right ascension	27	53	42½	9723.7

Otherwise by complement.

As the Sine of P ♋,
Is to the Tangent of ♋ ♉;
So is the whole Sine P Æ,
To the Tangent of Æ R the complement of R ♈ the rig[ht] ascention.

Case 3.

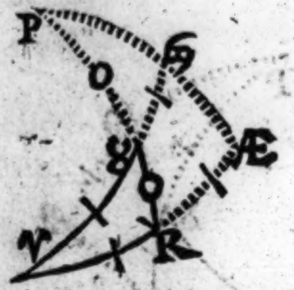
By the base and either side, to finde the other side.

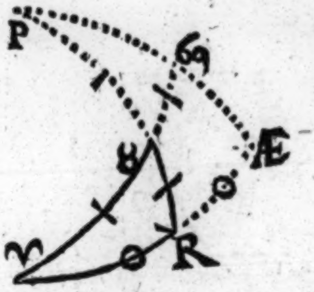
IN the same triangle ♈ R ♉, let the base ♈ ♉ be given, an[d] greater side ♈ R, to finde the lesser side ♉ R by conti[nuati]on, &c.

				Log.
As Æ R the cosine of ♈ R	27^d	53′	42″½	9946.3
Is to the whole sine R P	90	0	0	10000.0
So is ♋ ♉ the cosine of ♈ ♉	30	0	00	9937.5
To ♉ P the cosine of ♉ R	11	30	43½	9991.1

Or if you will avoid subtraction, take the Arithmeticall c[omple]ment of $27^d.\ 53'\ 42''\frac{1}{2}$, *which is* 0053.6435, *and adde [to]gether.*

Secondly, let the base ♈ ♉ bee given, and the lesser side to finde the greater side ♈ R by continuation &c.





				Log.
P ♉ the cosine of ♉ R	11^d	30′	43″ $\frac{1}{3}$	9991.1740
to ♉ ♋ the cosine of ♈ ♉	30	0	00	9937.5306
is the whole sine P R	90	0	00	10000.0000
R Æ the cosine of ♈ R	27	53	42 $\frac{1}{2}$	9946.3566

The Suns right ascention.

Case 4.

either side and the angle opposite unto it, to finde the other side.

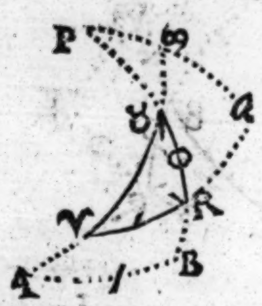
the same triangle ♈ R ♉, let the side ♈ R bee given, and the ngle ♉ opposite thereunto, to find the side ♉ R: Continue the es ♈ ♉ and ♉ R to quadrants, and A B shall bee the measure the angle at ♉.

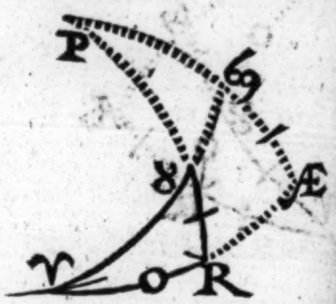
				Log.
A B the tang. of the angle A ♉ B	69^d	20′	35″ $\frac{1}{3}$	10423.6495
to the whole sine B ♉	90	0	0	10000.0000
is the tangent of ♈ R	27	53	42 $\frac{1}{2}$	9723.7546
the sine of R ♉	11	30	43 $\frac{1}{2}$	9300.1051

Or if you will avoyd subtraction, instead of the Tangent of d. 20′ 35″ $\frac{1}{3}$, take the complement thereof, 9576.3505, and de all together.

Secondly, instead of the angle ♉ and the side ♈ R, let the an- ♈ and the side ♉ R be given, and the side ♈ R be sought by ntinuation, &c.

As





				Log
As the Tangent of ♋ Æ the measure of the angle ♋ ♈ Æ	$23^{d}.31'$	$30''$		9638.8
Is to the whole Sine Æ ♈	90	0	00	10000.
So is the tang. of the lesser side ♉ R	11	30	$43\frac{1}{2}$	9308.
To the Sine of the greater side R ♈	27	53	$42\frac{1}{2}$	9670.

The Suns right ascen

Case 5.

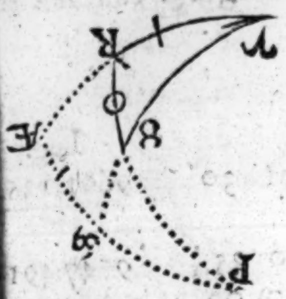
By either side and the angle opposite to the side sought, to fi[nde the] other side.

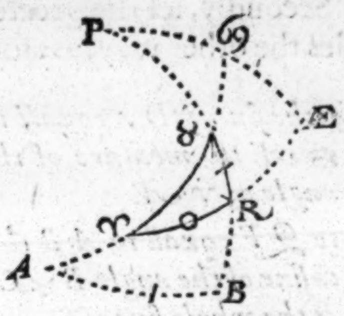
IN the same Triangle ♈ R ♉, let the angle ♈ be given, a[nd the] side ♈ R, to finde the side ♉ R opposite to the angle give[n] continuation, &c.

				Lo
As the whole Sine ♈ Æ	$90^{d}.$	$0'$	$0''$	10000
Is to Æ ♋ the tang. of the angle ♈	23	31	30	9638
So is the Sine of the side given ♈ R	27	53	$42\frac{1}{2}$	9670
To the tang. of the side sought R ♉	11	30	$43\frac{1}{2}$	9308

The Suns decli

Secondly, instead of the angle ♈ and the side ♈ R, angle ♉ be given, with the side ♉ R, and the other side sought: continue the sides, &c.





		Log.
the whole sine ♉ B	90^{d}. 0′ 0″	10000.0000
to B A the tang. of the angle A♉B	69 20 $35\frac{1}{3}$	10423.6495
is the sine of the side given ♉ R	11 30 $43\frac{1}{2}$	9300.1052
the tang. of the side sought R ♈	27 53 $42\frac{1}{2}$	9723.7547

The Suns right ascention.

Case 6.

By both the oblique angles, to finde either of the sides.

N the same Triangle ♈ R ♉, let the angles at ♈ and ♉ be given, nd let the lesser side ♉ R bee sought: continue the sides as ore.

		Log.
B C the sine of the angle B ♉ C	69^{d}.20′ 35″ $\frac{1}{3}$	9971.1413
o the whole sine B ♉	90 0 0	10000.0000
is ♋ P the cosine of the angle ♋ ♈ Æ	23 31 30	9962.3153
P ♉ the cosine of the side ♉ R	11 30 $43\frac{1}{2}$	9991.1740

The Suns declination.

Secondly

Secondly, let the greater side ♈ R be sought : continue
sides the other way, as afore.

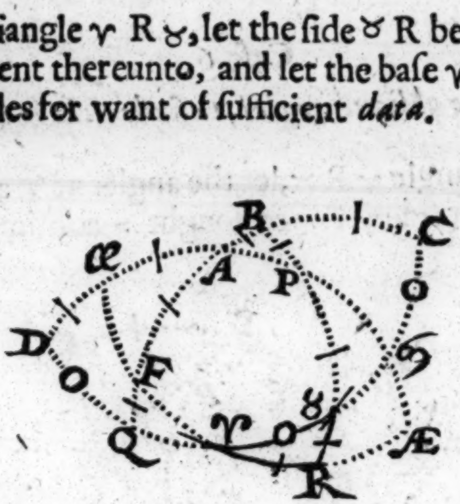
		Log
As the sine of D a equall to ♋ Æ the measure of the angle ♋ ♈ Æ	23d.31' 30"	9601.1
Is to Q F equall to A B the cosine of the angle B ♉ C	69 20 $35\frac{1}{3}$	95474
So is the whole sine a ♈	90 00 00	10000.0
To F ♈ the cosine of the side R ♈	27 53 $42\frac{1}{2}$	9946.

The Suns right ascention a

Case 7. BASE.

By either side and the angle adjacent, to finde the base.

IN the same triangle ♈ R ♉, let the side ♉ R bee given, and angle ♉ adjacent thereunto, and let the base ♈ ♉ bee sought: continue the sides for want of sufficient *data*.



		Log
As A B the cosine of B ♉ C	69d.20' $35\frac{1}{3}$	9547
Is to the tangent of B P equall to ♉ R	11 ,0 $43\frac{1}{3}$	9308
So is the whole sine A C	90 0 0	10000
To the tangent of C ♋ equall to ♈ ♉	30 0 0	9761

The distance of the Sunne f

Se

Secondly, instead of the greater angle ♉ and the lesser side R, let the lesser angle ♈ and the greater side ♈ R bee given: ontinue the sides as afore.

		Log.
As Ae, equall to P ♋ the cosine of ♋ ♈ Æ	23d.31′ 30″	9962.3153
to the tangent a F, equall to R ♈	27 53 42½	9723.7546
is the whole sine A D	90 00 00	10000.0000
the tangent of D ♌ equall to ♈ ♉	30 00 00	9761.4393

The same distance againe.

Case 8.

either side and the angle opposite thereunto, to finde the base.

the same triangle ♈ R ♉, let the lesser side ♉ R be given, and e angle ♈ opposite thereunto, to finde the base ♈ ♉, by conuation as afore.

		Log.
the sine of Æ ♋ the measure f the angle ♈	23d.31′ 30″	9601.1353
the whole sine ♋ ♈	90 00 00	10000.0000
the sine of the side ♉ R	11 30 43½	9300.1052
he sine of the base ♉ ♈	30 00 00	9698.8700

The distance of the Sunne from ♈

Secondly,

Secondly let the greater side ♈ R bee given, and the gr[eater] angle ♉ opposite thereunto, without continuation.

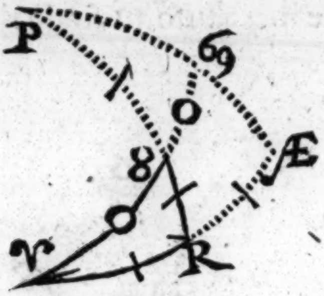
		Log
As the sine of the greater angle ♈ ♉ R	$69^d.20' 35'' \frac{1}{3}$	9971..
Is to the sine of the greater side ♈ R	27 53 42 $\frac{1}{2}$	9670..
So is the sine of ♈ R ♉	90 0 0	10000..
To the sine of the base ♈ ♉	30 0 0	9698..

The same distance ...

Case 9.

By both the sides given, to finde the base.

IN the same Triangle ♈ R ♉, let the side ♉ R, and th[e] ♈ R be given, to finde the base, by continuation as afo[re]

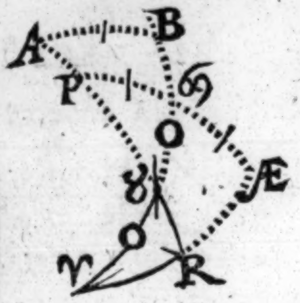


As the whole sine P R	$90^d.00' 00''$	1000..
Is to R Æ the cosine of the greater side ♈ R	27 53 42 $\frac{1}{2}$	994..
So is P ♉ the cosine of the lesser side ♉ R	11 30 43 $\frac{1}{2}$	999..
To ♉ ♋ the cosine of the base ♈ ♉	30 00 00	9993..

The Suns distance from ♈ ...

Case 10.

By both the oblique angles, to finde the base.



IN the same triangle ♈ R ♉, let the angle at ♉ and the angle at ♈ be given, to finde the base ♈ ♉: continue the sides for want of sufficient *data.*

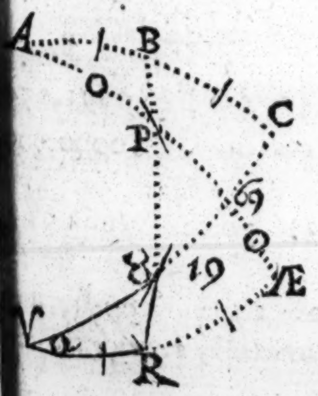
		Log.
the tang. of A B the measure of the greater angle B ♉ A	69d.20' 35'' $\frac{1}{3}$	10423.6495
to the whole sine B ♉	90 0 0	10000.0000
is P ♋ the cotangent of the lesser angle ♋ ♈ Æ	23 31 30	10361.1801
♋ ♉ the cosine of the base ♈ ♉	30 0 0	9937.5306

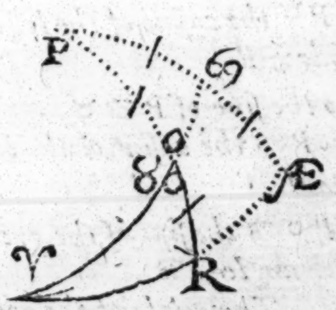
The same distance of the Sunne againe.

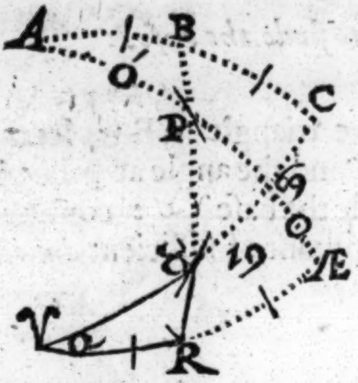
Case 11. ANGLES.

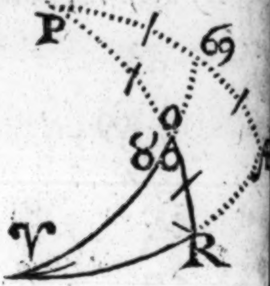
either side and the angle opposite thereto, to finde the other angle.

N the same triangle ♈ R ♉, let the greater side ♈ R and the greater angle ♉ opposite thereto bee given, to finde the lesser gle adjacent to the sides given: continue the sides as formerly.









As A P B, whose measure is R Æ, the cosine of the greater side ♈ R	27^{d}.53′ 43″$\frac{1}{5}$	9946.
Is to A B the cosine of the greater angle B ♉ C	69 20 35$\frac{1}{3}$	9547
So is the sine of A B P	90 00 00	10000
To the sine of A P equall to ♋ Æ the measure of the angle ♋ ♈ Æ	23 31 30	9601

The greatest declination of the S

Secondly, let the lesser side ♉ R be given, and the lesser ♈ opposite thereto, to finde the greater angle ♉ adjacent side given, by continuation as afore.

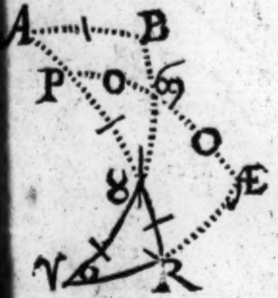
As P ♉ the cosine of the lesser side ♉ R	11^{d}.30′ 43″$\frac{1}{3}$	9991
Is to the sine of P ♋ ♉	90 00 00	10000
So is P ♋ the cosine of the lesser angle ♈	23 31 30	9961
To P ♉ ♋ the sine of the greater angle ♉ ♋	69 20 35	9971

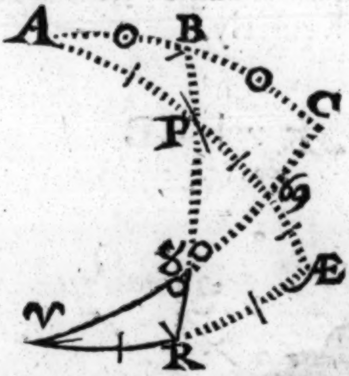
The angle of the ecliptick and meridian, because the verticall angles be the same.

Case 12.

Either side and the angle adjacent to it, to finde the angle opposite to that side.

In the same triangle ♈ R ♉, let the greater angle ♉ bee given, and the lesser side ♉ R, to finde the lesser angle ♈ opposite thereto: continue the sides as formerly.





The whole sine ♉ A	90d.00′ 00″	10000.0000
To ♉ P the cosine of the lesser side ♉ R	11 30 43½	9991.1740
To A B the sine of the greater angle A ♉ B	69 20 35⅓	9971.1413
P ♋ the cosine of ♋ Æ the measure of the lesser angle ♈ Æ	23 31 30	+9962.3153

The greatest declination of the Sunne as afore.

Secondly, let the lesser angle ♈ and the greater side ♈ R bee given, to finde the greater angle ♉ opposite thereto, by continuation as afore.

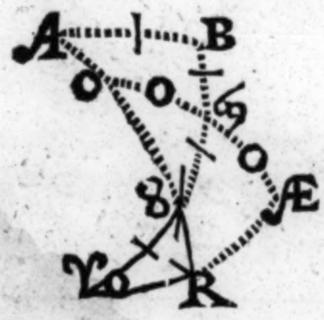
The sine of A B P	90d.00′ 00″	10000.0000
To the sine of A P equall to ♋ Æ the measure of the lesser angle ♈	23 31 30	9601.1353
So the sine of A P B whose measure is R Æ the cosine of the greater side ♈ R	27 53 42½	9946.3565
To A B the cosine of B C the measure of the greater angle ♉	69 20 35⅓	+9547.4918

The angle of the ecliptick and meridian as afore.

Case 13.

By the base and one angle, to finde the other angle.

IN the same triangle ♈ R ♉, let the base ♈ ♉ be given, greater angle ♉, to finde the lesser angle ♈ : continue as formerly.



As the whole sine ♉ B	90d.00′ 00″	1000
Is to ♉ ♋ the cosine of the base ♈ ♉	30 00 00	993
So is the tangent of B A the measure of the greater angle ♉	69 20 35 ⅓	1042
To P ♋ the cotangent of ♋ Æ the measure of the lesser angle ♈	23 31 30	1036

The greatest declination

Secondly, let the base ♈ ♉ and the lesser angle ♈ be given, to finde the greater angle ♉, by continuation, &c.

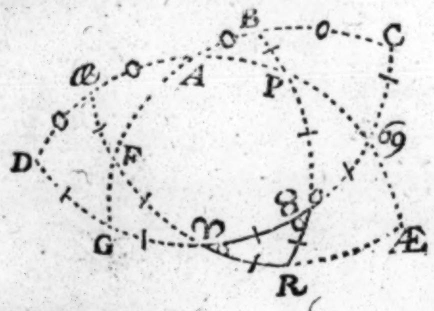
As ♉ ♋ the cosine of the base ♈ ♉	30d.00′ 00″	99
Is to P ♋ the cotangent of ♋ Æ the measure of the angle ♈	23 31 30	1036
So is the whole sine ♉ B	90 00 00	1000
To the tangent of B A the measure of the greater angle ♉	69 20 35 ⅓	1042

The angle of the meridian and

Caſe 14.

y the baſe and either ſide, to finde the angle comprehended by them.

N the ſame triangle ♈ R ♉, let the baſe ♈ ♉ and the greater ſide ♈ R be given, to finde the leſſer angle ♈ comprehended y them: continue the ſides as formerly.



		Log.
the tangent of G D equall to ♈ ♉	30^d. 0′ 0″	9761.4393
to the whole ſine D A	90 0 0	10000.0000
is the tangent of F æ equall to ♈ R	27 53 42½	9723.7546
æ A the coſine of æ D equall to Æ ♋ the meaſure of the angle ♈	23 31 30	19962.3153

The greateſt declination as afore: or as tangent R Æ is to the ſine Æ P, ſo is the tangent ♉ ♋ to the ſine ♋ P.

Secondly, let the baſe ♈ ♉ and the leſſer ſide ♉ R bee given, finde the greater angle ♉ comprehended by them; by conti-ation of the ſides as afore.

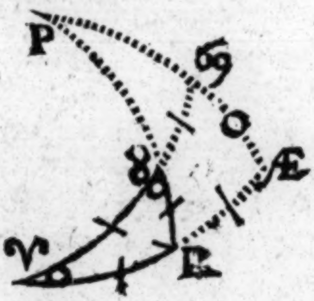
		Log.
the tangent of ♋ C equall to he baſe ♈ ♉	30^d.00′ 00″	9761.4393
to the whole ſine C A	90 00 00	10000.0000
is the tangent of P B equall to he ſide ♉ R	11 30 43½	9308.9312
B A the coſine of B C he meaſure of the greater angle ♉	69 20 35⅓	9547.4919

The angle of the meridian and ecliptick.

Case 15.

By the base and either side, to finde the angle opposite to th

IN the same triangle ♈ R ♉, let the base bee given ♈♉ the lesser side ♉ R, to finde the lesser angle ♈ opposite th by continuation of the sides, as afore.



As the sine of the base ♈ ♉	30^d 0′ 0″
Is to the sine of the lesser side ♉ R	11 30 43 $\frac{1}{3}$
So is the whole sine ♈ ♋	90 0 0
To to the sine of ♋ Æ the measure of the lesser angle ♈	23 31 30

The Sunnes greatest decl

Secondly let the base ♈ ♉, and the greater side ♈ R b to finde the greater angle ♉ opposite thereto, witho nuation, &c.

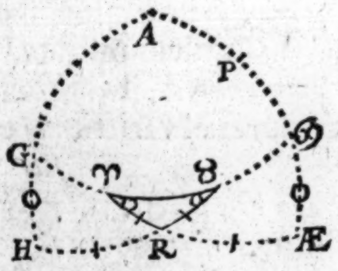
As the sine of the base ♈ ♉	30^d 00′ 00″
Is to the sine of ♈ R ♉	90 00 00
So is the sine of the greater side ♈ R	27 53 42 $\frac{1}{2}$
To the sine of the greater angle ♈ ♉ R	69 20 35 $\frac{1}{3}$

The angle of the ecliptick and meridian,

Case 16.

By both the sides, to finde either oblique angle.

IN the same triangle ♈ R ♉, let the greater side ♈ R, and the lesser side ♉ R be both given, to finde the lesser angle ♈: continue the sides as formerly.



		Logar.
As the sine of the greater side ♈ R	$27^{d}\ 53'\ 42''\frac{1}{2}$	9670.1111
to the tangent of the lesser side ♉ R	11 30 $43\frac{1}{3}$	9308.9312
is the whole sine ♈ Æ	90 00 00	10000,0000
the tang. of Æ ♋ the measure of the lesser angle ♈	23 31 30	9638.8201

The Sunnes greatest declination as afore.

Secondly, let both sides be given, as afore, and the greater angle ♉ be sought, by continuation as formerly.

		Logar.
As the sine of the lesser side ♉ R	$11^{d}\ 30'\ 43''\frac{1}{3}$	9300.1052
to the tangent of the greater side R ♈	27 53 $42\frac{1}{2}$	9723.7546
is the whole sine ♉ H	90 00 00	10000.0000
the tangent of H G the measure of the greater angle ♉	69 20 $35\frac{1}{3}$	10423.6494

The angle of the ecliptick and circle of declination as afore.

 OF

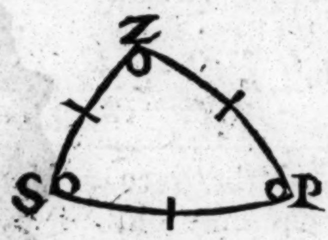
OF OBLIQVE TRIANGLES.

Case 1.

By the three sides, to finde any of the angles.

IN these oblique triangles there are 12 Cases and threescore rieties ; but because there is little use of them in this Trea and they are already learnedly demonstrated by Mr. *Henry* *librand in Trigonom. Brittannica* ; I will only give exampl the Cases, and leave the severall varieties to every mans pr practice.

Let the triangle P Z S represent three great circles of Sphere : P Z part of the meridian of the place between the and zenith, P S part of any other meridian between the po the Sun, & Z S part of any azimuth between the zenith an Sunne. And let the three sides be given, *vizt.* P Z 38 d. 28 complement of the latitude, P S 70 d. 0' the complement o declination, and Z S 40 d. 0' the complement of the Sunne titude ; to finde any of the three angles.



Let the side opposite to the angle required be alwayes fi the operation ; and then the rule is. Adde the three sides t ther, out of halfe the summe subtract every side, so have the differences ; the Arithmeticall complements of the L rithmes of halfe the summe & difference of the base added the Logarithmes of the difference of the other two sides, a number, the halfe whereof is the Logarith. tangent of halfe angle desired.

The base P S	70 d.	0′		
The sides Z S	40	0		
The sides Z P	38	28		
The summe	148	28	Logar.	
The halfe sum	74	14	0016.6551	*Arith. compl.*
Diff. of the base	4	14	1131.8354	*Arith. compl.*
Diff. of the sides	34	14	9750.1723	
Diff. of the sides	35	46	9766.7739	
Totall			20665.4367	
The halfe			10332.7183	

Is the Logarith. tangent of halfe the angle 65 *d.* 4′ 12″ 76

The double is the angle Z 130 *d.* 8′ 25 52

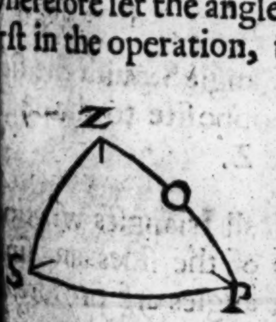
Thus may you finde the angle P to be 31 d. 31′ 43″ 42, if you make Z S the base 40 d. 0′, instead of P S 70 d. 0′.

And so also the angle S to be 30 d. 24′ 6″ 98, if you make P Z the base 38 d. 28′, instead of P S, 70 d. 0.

Case 2.

By the three angles, to finde any of the sides.

IN the same triangle P Z S, let the three angles P, Z, and S be given, to finde the three sides, Z P, Z S, and P S. This case is but the converse of the former, and the sides turned into angles; wherefore let the angle opposite to the side required be alwayes first in the operation, then is the rule the same.



Adde the three angles together, out of halfe the summe of them subtract every angle, so have you the differences; the Arithmeticall complements of the Logarithmes of halfe the summe and difference of the angle opposite to the side required, added unto the Logarithmes of the difference of the other two angles, give a number, the halfe whereof is the Logarith. tangent of halfe the side desired.

The angle opposite S		30^{d}	$24'$	$7''$	
The other angles	*P*	31	31	43^{42}	
	Z	49	51	34^{48}	*Compl.*
The summe		111	47	24^{90}	Logar.
The halfe summe		55	53	42^{45}	0081.9631 } *Ar.com*
Differ. of the angle S		25	29	35^{45}	0366.1239 }
Diff of the angle P		24	21	59^{03}	9615.4977
Diff. of the angle Z		6	2	7^{57}	9021.7911
			Totall		19085.3758
			The halfe		9542.6879 *Is the*

Logarith. tangent of halfe the side 19^{d} $14'$
The double is the whole side P Z 38 28

Thus may you finde the side Z S to bee 40 d. 0', if you make P the angle opposite to the side sought, 31 d. 31' 43'' $\underline{42}$ instead of S 30 d. 24' 7''.

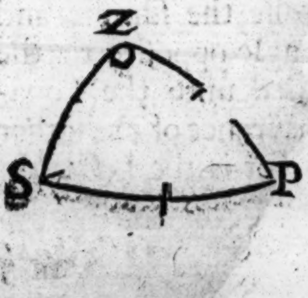
And so also the side P S to be 70 d. 0', if you make Z the angle opposite to the side sought 130 d. 8' 25'' $\underline{52}$ instead of S 30 d. 24' 7''.

Note, because 49 d. 51' 34'' $\underline{48}$ is the complement of the angle Z to 180 d. therefore the number found is the cotangent of halfe the side S P desired.

Case 3.

By any angle and the two sides opposite to the angle given and sought, to finde the other angles.

IN the same triangle P Z S, let the acute angle S, with the side Z P opposite thereto, and the side P S opposite to the angle sought be given, to finde the obtuse angle Z.



In all sphericall triangles whatsoever, the sines of the sides and of the opposite angles are proportionall one to the other, and contrariwise, *the 16 and 17 of the 4 book of Pitiscus* ... *omont.*

				Logar.
As the sine of the side PZ	38^d 28′	0″		0206.1683 *Ar. comp.*
is to the sine of the angle PSZ	30	24	7	9704.2046
so is the sine of the side PS	70	0	0	9972.9858
to the sine of the angle PZS	130	8	$25\frac{1}{2}$	19883.3587

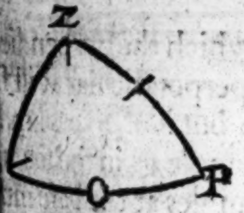
or 49 d. 51′ 34″ ½, because the same sine serves both for the obtuse and acute angle.

And so of the other angle, giving the side Z S instead of Z P.

Case 4.

Any side and the two angles opposite to the sides given & sought, to finde the other two sides.

IN the same triangle P Z S, let the side P Z and the two angles, S opposite to the side given, and Z opposite to the side sought, be given, to finde the side P S.



This case is but the converse of the former, for in all sphericall triangles the sines of the angles and of their opposite sides are proportionall one to the other, *by the same* 16 *and* 17 *prop. of the* 4 *book of Regiomont*.

				Logar.
As the sine of the angle PSZ	30^d	24′	7″	0295.7954 *Ar. comp.*
to the sine of the opposite side PZ	38	28	0	9793.8317
is the sine of the angle PZS	130	8	25 ½	9883.3587 or 49^d 51′ 34″ ½
the sine of the opposite side PS	70	0	0	19972.9858

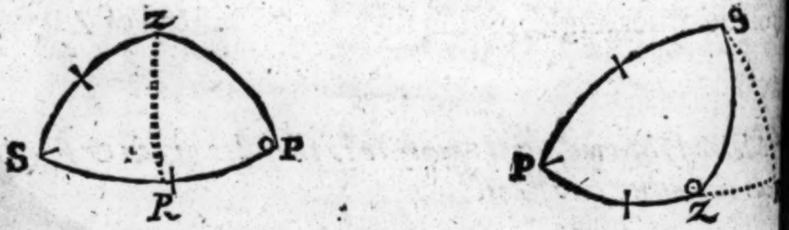
And so may the other side bee also found, giving the angle P instead of Z or S.

Case 5

Case 5.

By two sides and the angle comprehended, to finde the o[ther] angles.

IN the same triangle P Z S, let the greater side P S, and on[e of] the lesser sides Z S, and one of the acute angles S compre[hen]ded bee given, to finde the other acute angle P, or obtuse [an]gle Z.



This case and the rest that follow, must bee resolved by [the help] of a perpendicular, which may fall both within and wi[thout] the triangle, reducing the oblique triangle into two rig[ht an]gled triangles: wherein observe,

1 That if the angles at the base (upon which the perpen[dicu]lar alwayes fals) be both of one kind, the perpendicular w[ill fall] within the triangle, as in the first variety: but if of divers k[inds] the perpendicular will fall without the triangle, as in the se[cond] variety; and therefore the kinde of the angles at the base [must] alwayes be known.

2 That in this case the base is one of the sides given adj[oyning] to the angle sought, and the perpendicular must alwa[yes fall] from the extreame of the other side given, upon the base [con]tinued, if there be cause.

The proportionals.

As the Radius,
Is to the cosine of the angle given,
So is the tangent of the hypotenusa,
To the tangent of the base between the angle given and th[e per]pendicular.

Sec

Secondly,

s the sine of the base between the angle given and perpendicular,
to the sine of the base between the angle sought and perpendicular,
is the tangent of the angle given,
to the tangent of the angle sought.

	I	Logar.
the sine of Z R S	90d. 0′ 0″	10000.0000
to the cosine of Z S R	30 24 7	9935.7574
is the tangent of Z S	40 0 0	9923.8135
to the tangent of R S	35 53 38 $\frac{1}{2}$	19859.5709
P S	70 0 0	
P R	34 6 21 $\frac{1}{2}$	

	Secondly,	Logar.
the sine P R	34d. 6′ 21″ $\frac{1}{2}$	0251.2498 Ar.com.
to the sine S R	35 53 38 $\frac{1}{2}$	9768.1109
is the tang. of Z S R	30 24 7	9768.4472
the tang. of Z P R	31 31 43 $\frac{2}{7}$	19787.8079

	II	Logar.
the sine of P R S	90d. 0′ 0″	10000.0000
to the cosine of R P S	31 31 43 $\frac{2}{7}$	9930.6323
is the tangent of P S	70 0 0	10438.9341
the tangent of P R	66 52 38	10369.5664
P Z	38 28 0	
Z R	28 24 38	

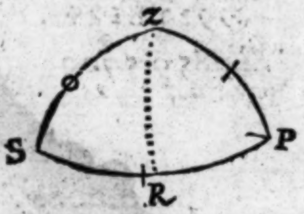
	Secondly,	Logar.
the sine of Z R	28d.24′ 38″	0322.5882 Ar.com.
to the sine of P R	66 52 38	9963.6309
is the tang. of S P R	31 31 43 $\frac{2}{7}$	9787.8079
the tang. of S Z R	49 51 34 $\frac{1}{2}$	10074.0270
Therefore S Z P	130 8 25 $\frac{1}{2}$	

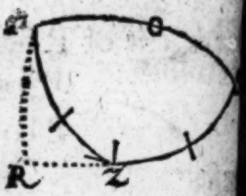
Case

Case 6.

By two sides and the angle comprehended, to finde the side.

IN the same triangle P Z S, let the greater side P S, and on the lesser sides P Z, and the acute angle P comprehended given, to finde the other side Z S : or let the two lesser s Z P, and Z S, with the obtuse angle Z comprehended be gi to finde the greater side P S.





In this case also the base is one of the sides given, and the pendicular must fall from the extream of the other side g and continued if there be cause ; and therefore may fall i ferently, from Z or S in the first variety, and from P or S i second variety, but whether within or without the triang first of the former cautions will direct you.

The proportionals.

As the Radius,
Is to the cosine of the angle given,
So is the tangent of the hypotenusa,
To the tangent of the base between the side given (and the pendicular.

Secondly,

As the cosine of the base between the side given and perpendi
Is to the cosine of the base between the side sought and perp cular,
So is the cosine of the side given,
To the cosine of the side sought.

I		Logar.
As the sine of Z R P	90d. 0′ 0″	10000.0000
Is to the cosine of Z P R	31 31 $43\frac{2}{3}$	9930.6323
So is the tangent of Z P	38 28 0	9900.0865
To the tangent of R P	34 6 $21\frac{1}{2}$	x9830.7188
P S	70 0 0	
R S	35 53 $38\frac{1}{2}$	

Secondly,		Logar.
As the cosine of P R	34d. 6′ 21″$\frac{1}{2}$	0081.9687 Ar.com.
Is to the cosine of S R	35 53 $38\frac{1}{2}$	9908.5401
So is the cosine of P Z	38 28 0	9893.7452
To the cosine of S Z	40 0 0	x9884.2540

II		Logar.
As the sine of Z R S	90d. 0′ 0″	10000.0000
Is to the cosine of R Z S	49 51 $34\frac{1}{2}$	9809.3327
So is the tangent of S Z	40 0 0	9923.8135
To the tangent of R Z	28 24 38	x9733.1462
Z P	38 28 0	
R P	66 52 38	

Secondly.		Logar.
As the cosine of Z R	28d.24′ 38″	0055.7344 Ar.com.
Is to the cosine of P R	66 52 38	9594.0645
So is the cosine of Z S	40 0 0	9884.2539
To the cosine of P S	70 0 0	x9534.0528

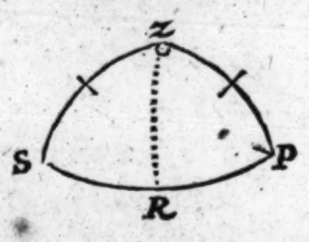
Case 7.

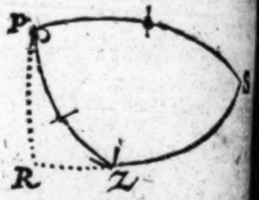
Two sides and an angle adjacent to either, to finde the other angles.

In the same triangle P Z S, let the two lesser sides Z P and Z S, and the acute angle P adjacent to the side Z P bee given, to finde the obtuse angle Z. Or let the greater side P S, and one of the lesser sides P Z, and the obtuse angle Z adjacent to the side P Z be given, to finde the acute angle P.

In

In this case the base is alwayes the side unknown, and perpendicular must fall from the angle sought, upon the continued, if there be cause; but whether within or with the triangle, the caution of the fift case will direct you.





The proportionals.

As the Radius,
Is to the cosine of the side adjacent to the angle given,
So is the tangent of the angle given,
To the cotangent of the angle between the same side and the pendicular.

Secondly,

As the tangent of the side opposite to the angle given,
Is to the tangent of the other side adjacent,
So is the cosine of the angle last found,
To the cosine of the angle between the side opposite and the pendicular.

	I	Logar.
As the sine of Z R P	90^d. 0′ 0″	10000.0000
Is to the cosine of Z P	38 28 0	9893.745
So is the tangent of Z P R	31 31 43 $\frac{2}{5}$	9787.8079
To the cotang. of P Z R	64 20 35	19681.553

	Secondly,	Logar.
As the tangent of Z S	40^d 0′ 0″	10076.1864
Is to the tang. of Z P	38 28 0	9900.0865
So is the cosine of P Z R	64 20 35	9636.4720
To the cosine of S Z R	65 47 51	19612.7449
Therefore S Z P	130 8 26	

II				Logar.
As the ſine of S R P	90^d	$0'$	$0''$	10000.0000
Is to the coſine of Z P	38	28	0	9893.7452
So is the tangent of R Z P	49	51	$34\frac{1}{3}$	10074.0258
To the cotangent of R P Z	47	7	$26\frac{1}{3}$	9967.7710

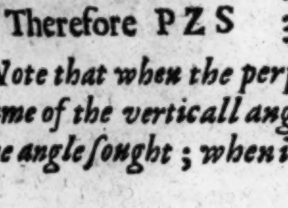
Secondly,				Logar.
As the tangent of S P	70^d	$0'$	$0''$	09561.0658 Ar.com.
Is to the tangent of Z P	38	28	0	9900.0865
So is the coſine of R P Z	47	7	$26\frac{1}{3}$	9832.7732
To the coſine of S P R	78	39	10	9293.9255
Therefore P Z S	31	31	$43\frac{2}{3}$	

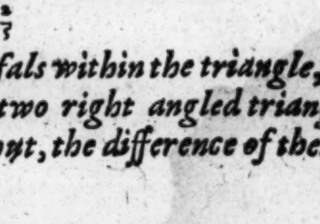
Note that when the perpendicular fals within the triangle, the ſumme of the verticall angles of the two right angled triangles is the angle ſought; when it fals without, the difference of them.

Caſe 8.

By two ſides and an angle adjacent to either, to finde the other ſide.

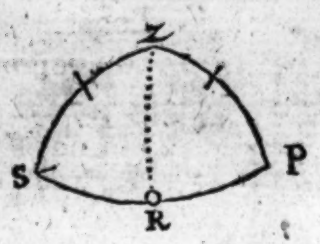
IN the ſame triangle P Z S, let the two leſſer ſides P Z and Z *S*, and one of the acute angles *S* adjacent to the ſide Z *S* bee given, to finde the greater ſide P *S*. Or let the greater ſide P *S*, and one of the leſſer ſides Z *S*, and the acute angle P adjacent to the ſide P *S* be given, to finde the other ſide Z P.

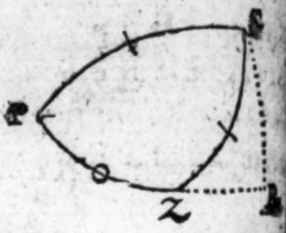




In this caſe the baſe is alwayes the ſide ſought, and the perpendicular muſt fall from the oppoſite angle upon the baſe continued if there be cauſe; but whether within or without the triangle, the caution of the fift caſe will direct you.

The





The proportionals.

As the Radius,
Is to the cosine of the angle given,
So is the tangent of the side adjacent to the angle given,
To the tangent of the base between the perpendicular and th-
gle given.

Secondly,

As the cosine of the side adjacent to the angle given,
Is to the cosine of the side opposite to the angle given,
So is the cosine of the base between the perpendicular and the
known.
To the cosine of the base between the perpendicular and the
unknown.

	I			Logar.
As the sine of Z R S	90^d.	0′	0″	10000.0000
Is to the cosine of Z S R	30	24	7	9935.7574
So is the tangent of Z S	40	0	0	9923.8135
To the tangent of R S	35	53	38½	9859.5709

	Secondly,			Logar.
As the cosine of Z S	40^d	0′	0′	0115.7461
Is to the cosine of Z P	38	28	0	9893.7452
So is the cosine of R S	35	53	38½	9908.5401
To the cosine of R P	34	6	21½	9918.0314
Therefore S P	70	0	0	

	II	Logar.
the sine of P R S	90d 0′ 0″	10000.0000
to the cosine of R P S	31 31 43	9930.6323
is the tangent of P S	70 0 0	10438.9341
the tangent of P R	66 52 38	10369.5664

	Secondly,	Logar.
the cosine of P S	70d 0′ 0″	0465.9484 Ar.com.
to the cosine of Z S	40 0 0	9884.2539
is the cosine of P R	66 52 38	9594.0645
the cosine of Z R	28 24 38	19944.2668
Therefore Z P	38 28 0	

e that when the perpendicular fals within the triangle, the summe of the bases of the two right angled triangles, is the side sought; when it fals without, the difference of them.

Case 9.

two angles and the side comprehended, to finde the other angles.

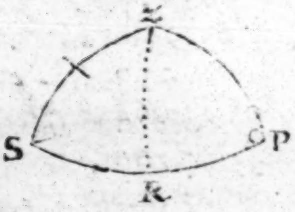
the same triangle P Z S, let the obtuse angle Z, & the acute angle *S*, and the side Z S comprehended bee given, to find the r acute angle P. Or let the two acute angles P and S, with side P S comprehended be given, to find the obtuse angle Z. n this case the base may be either of the sides unknown, and perpendicular must fall from one of the known angles upon base continued if there be cause: and therfore may fall indifntly from Z or S in the first variety; and from P or S in the nd variety; but whether within the triangle, or without, caution of the fift case will direct you.

The proportionals.

he Radius,
the cosine of the side comprehended,
the tangent of the angle at the base,
he cotangent of the angle between the perpendicular and side iven.

Secondly,

As the sine of the angle between the perpendicular and side
Is to the sine of the angle between the perpend. and sine un
So is the cosine of the angle at the base,
To the cosine of the angle desired.



	I			Logar.
As the sine of Z R S	90^{d}	0'	0"	10000.00
Is to the cosine of Z S	40	0	0	9884.25
So is the tangent of Z S R	30	24	7	9768.44
To the cotangent of S Z R	65	47	51	x9652.70
S Z P	130	8	26	
R Z P	64	20	35	

	Secondly,			Logar.
As the sine of R Z S	65^{d}	47'	51"	0039.9565
Is to the sine of R Z P	64	20	35	9954.9188
So is the cosine of Z S R	30	24	7	9935.7574
To the cosine of Z P R	31	31	$43\frac{2}{3}$	x9930.6327

	II			Logar.
As the sine of P R S	90^{d}	0'	0"	10000.00
Is to the cosine of P S	70	0	0	9534.05
So is the tangent of P S Z	30	24	7	9768.44
To the cotangent of S P R	78	39	10	x9302.49
Z P S	31	31	$43\frac{2}{3}$	
Z P R	47	7	26	

Secondly,

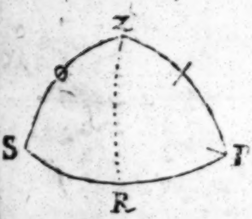
s the sine of S P R	78^{d}	$39'$	$10''$	0008.5733 Ar.com.
to the sine of Z P R	47	7	$26\frac{3}{5}$	9865.0022
is the cosine of R S P	30	24	7	9935.7574
o the cosine of R Z S	49	51	$34\frac{1}{2}$	19809.3329
Therefore P Z S	130	8	$25\frac{1}{3}$	

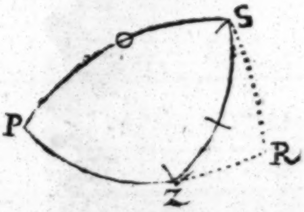
Case 10.

two angles and the side comprehended, to finde the other sides.

the same triangle P Z S, let the obtuse angle Z, and the acute gle P, with the lesser side Z P comprehended be given, to le the other lesser side Z S. Or let the obtuse angle Z, and the e angle S, with the lesser side Z S comprehended be given, inde the greater side P S.

n this case the base is alwayes the third side, neither given sought, and the perpendicular must fall from the angle gi- adjacent to the side sought upon the base continued if there cause, but whether within the triangle or without, the cau- of the fift case will direct you.





The proportionals.

he Radius,
the cosine of the side given,
the tangent of the angle at the base,
e cotangent of the angle between the perpendicular and the e given.

 Secondly,

Secondly,

As the cosine of the angle between the perpendicular an[d] sought,
Is to the cosine of the angle between the perpendicular a[nd] given,
So is the tangent of the side given,
To the tangent of the side sought.

I

				Logar.
As the sine of Z R P	90^d	0′	0″	10000.000
Is to the cosine of Z P	38	28	0	9893.749
So is the tangent of Z P R	31	31	43 $\frac{2}{3}$	9787.807
To the cotangent of P Z R	64	20	35	x9681.55
P Z S	130	8	25 $\frac{1}{2}$	
R Z S	65	47	50 $\frac{1}{2}$	

Secondly,				Logar.
As the cosine of S Z R	65^d	47′	50″ $\frac{1}{2}$	0387.2551
Is to the cosine of P Z R	64	20	35	9636.4720
So is the tangent of Z P	38	28	0	9900.0865
To the tangent of Z S	40	0	0	x9923.0136

II

				Logar.
As the sine of P R S	90^d.	0′	0″	10000.0
Is to the cosine of Z S	40	0	0	9884.2
So is the tangent of S Z R	49	51.	34 $\frac{1}{2}$	10074.0
To the cotangent of Z S R	47	44	52	x9958.2
Z S P	30	24	7	
R S P	78	8	59	

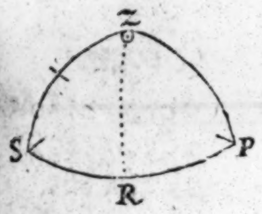
Secondly,				Logar.
As the cosine of P S R	78^d.	8′	59″	0687.4961
Is to the cosine of Z S R	47	44	52	9827.6244
So is the tangent of Z S	40	0	0	9923.8135
To the tangent of P S	70	0	0	x0438.9349

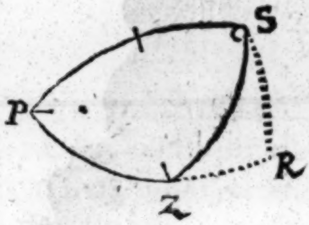
Case 11.

By two angles and the side adjacent to either, to finde the other angle.

IN the same triangle P Z S, let the two acute angles P and S, and the side Z S adjacent to the angle S be given, to finde the obtuse angle Z. Or let the obtuse angle Z, and one of the acute angles P, with the side P S adjacent to the angle P be given, to finde the acute angle S.

In this case the base is alwayes opposite to the angle sought, and the perpendicular must fall from the angle sought upon the base continued if there be cause; but whether within the triangle, or without, the caution of the fift case will direct you.





The proportionals.

As the Radius,
is to the cosine of the side given,
so is the tangent of the angle adjacent to the side given,
to the cotangent of the angle comprehended by the perpendicular and the side given.

Secondly,

As the cosine of the angle adjacent to the side given,
is to the cosine of the other angle given,
so is the sine of the angle comprehended by the perpendicular and side known,
to the sine of the angle comprehended by the perpendicular and side unknown.

I

		Logar.
As the sine of Z R S	90ᵈ. 0′ 0″	10000.0000
Is to the cosine of Z S	40 0 0	9884.2539
So is the tangent of Z S R	30 24 7	9768.4472
To the tangent of S Z R	65 47 51	19652.7011

Secondly,

		Logar.
As the cosine of Z S R	30ᵈ.24′ 7″	0064.2426 Ar.c
Is to the cosine of Z P R	31 31 43 $\frac{2}{7}$	9930.6323
So is the sine of R Z S	65 47 51	9960.0435
To the sine of R Z P	64 20 35	19954.9184
Therefore S Z P	130 8 26	

II.

		Logar.
As the sine of P R S	90ᵈ 0′ 0″	10000.0000
Is to the cosine of P S	70 0 0	9534.0516
So is the tangent of S P R	31 31 43 $\frac{2}{7}$	9787.8079
To the cotangent of P S R	78 8 59	19321.8595

Secondly,

		Logar.
As the cosine of R P S	31ᵈ 31′ 43 $\frac{2}{7}$	0069.3677 Ar.c
Is to the cosine of R Z S	49 51 34 $\frac{1}{2}$	9809.3327
So is the sine of P S R	78 8 59	9990.6444
To the sine of Z S R	47 44 52	19869.3448
Therefore Z S P	30 24 7	

Note, that when the perpendicular fals within the triangle the summe of the verticall angles of the two right angled triangles is the angle sought, but when it fals without, the difference of them.

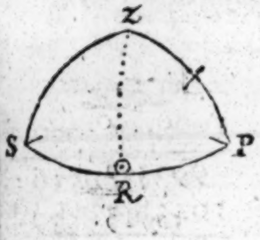
Case

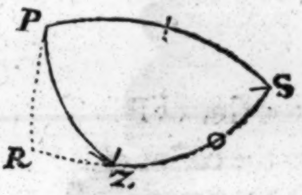
Case 12.

By two angles and the side adjacent to either, to finde the other sides.

IN the same triangle P Z S, let the two acute angles P and S, with the side Z P adjacent to the angle P bee given, to finde the greater side P S. Or let the obtuse angle Z, and one of the acute angles S, with the side P S adjacent to the angle S bee given, to finde the lesser side Z S.

In this case the base is awayes the side sought, and the perpendicular must fall from the angle oppsite to the side sought upon the base continued if there bee cause; but whether within the triangle, or without, the caution of the fift case will direct you.





The proportionals.

As the Radius,
to the cosine of the angle adjacent to the side given,
is the tangent of the side given,
the tangent of the base between the perpendicular and the side given.

Secondly,

the tangent of the angle opposite to the side given,
to the tangent of the angle adjacent to the side given,
is the sine of the base between the perpendicular and side known,
the sine of the base between the perpendicular and side unknown.

As

I

					Logar.
As the sine of Z R P	90^{d}.	0′	0″		10000.0000
Is to the cosine of Z P R	31	31	43 $\frac{2}{7}$		9930.6323
So is the tangent of Z P	38	28	0		9900.0865
To the tangent of R P	34	6	21 $\frac{1}{2}$		19830.7188

Secondly,

				Logar.
As the tangent of Z S P	30^{d}	24′	7″	10231.5527 Ar.
Is to the tang. of Z P R	31	31	43 $\frac{2}{7}$	9787.8079
So is the sine of P R	34	6	21 $\frac{1}{2}$	9748.7501
To the sine of S R	35	53	38 $\frac{1}{2}$	29768.1107
Therefore P S	70	0	0	

II

				Logar.
As the sine of P R S	90^{d}	0′	0″	10000.0000
Is to the cosine of P S R	30	24	7	9935.7574
So is the tangent of P S	70	0	0	10438.9341
To the tangent of R S	67	7	13 $\frac{2}{7}$	10374.6915

Secondly,

				Logar.
As the tangent of R Z P	49^{d}	51′	34″ $\frac{1}{2}$	9925.9742 Ar.
Is to the tang. of R S P	30	24	7	9768.4472
So is the sine of S R	67	7	13 $\frac{2}{7}$	9964.4123
To the sine of Z R	27	7	13 $\frac{2}{7}$	29658.8337
Therefore Z S	40	0	0	

Note that when the perpendicular fals within the triangle summe of the bases of the two right angled triangles is sought; but when it fals without, the diffence of them.

CHAP. IV.

The explanation and making of the fundamentall Scheme.

THis Scheme repreſenteth to the eye the true and naturall ſituation of thoſe circles of the Sphere, whereof wee ſhall have uſe in the deſcription of ſuch ſorts of Dials, as any flat or plane is capable of: It is therefore neceſſary, firſt to explane the ſame, and the making there- that the Symetry of the Scheme with the Globe being well derſtood, the repreſentation of every plane therein may bee better conceived.

Suppoſe therefore, that the Globe elevated to the heighth of Pole, bee preſſed flat downe into the plane of the Horizon, en will the outward circle or limbe of this Scheme N E S W preſent that Horizon, and all the circles contained in the up- Hemiſphere of the Globe may be artificially contrived and preſented thereon, as are Azimuthes, Almicanters, Meridi-, Paralels, Equator, Ecliptick, Tropicks, and circles of Poſin, &c. which are thus diſtinguiſhed in the Diagram.

Let Z be the Zenith of the place, and center of the horizon- circle N E S W, let N Z S be the Meridian, P the Pole of the rld, elevated above the north part of the Horizon N, here at *ndon*, 51 d. 32′, the complement whereof is P Z 38 d. 28′, diſtance between the Pole and the Zenith, E Z W the prime ticall, D Z G and C Z V any other intermediate Azimuthes, DS a circle of Poſition, E K W the Equator, the diſtance ereof from Z is equall to P N the heigth of the Pole, or from quall to P Z the complement thereof, *n* B Q *r* the Tropick paralell of ♋, *p* F *t* the Tropick of ♑, and B R Q an Almiter, or paralell to the Horizon: The reſt of the circles inter-ting each other in the point P are the Meridians or houre-cles cutting the horizon and other circles of this Diagram ſo he Scheme, as they do in the Globe it ſelfe.

Amongſt theſe, the Azimuthes only in this projection be-ne ſtreight lines, all the reſt remaine circles, and are greater

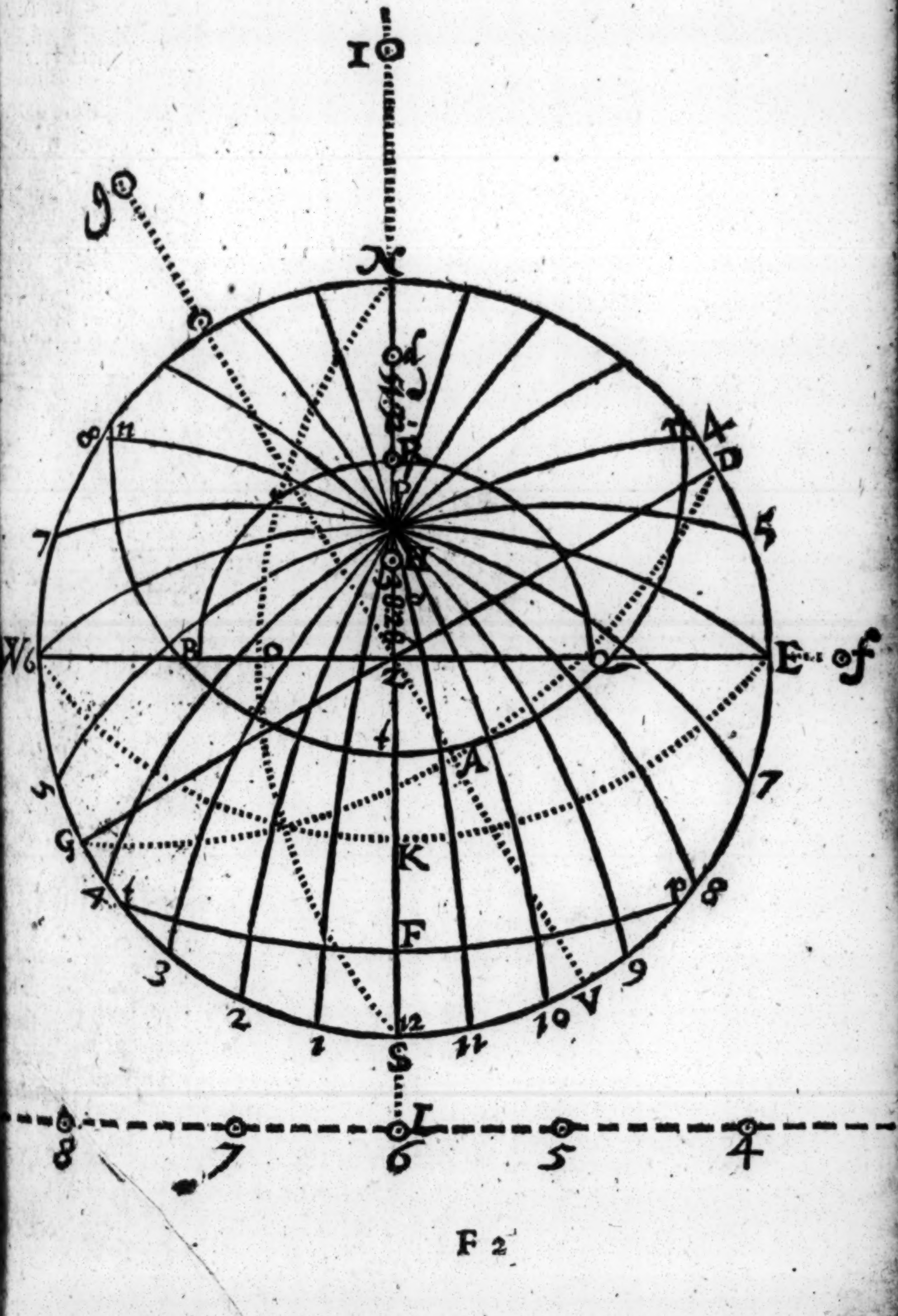
or leſſer according to their naturall ſituation in the Globe, the ſtreight lines are repreſented all erect planes, whether d[illegible] or declining; by the great circles, all the reſt, both jacent, r[illegible] ning, and declining reclining, which for more plainneſſe may thus particularly be deſcribed.

E Z W the prime verticall, or Azimuth of Eaſt and W[illegible] repreſenteth all South and North planes, which are perp[illegible] cular to the Horizon, and croſſe the Meridian at right an[illegible] N Z S the Meridian or Azimuth of South and North, repre[illegible] eth all Eaſt and Weſt planes, which are perpendicular t[illegible] Horizon, as the former, and cut the prime verticall at rig[illegible] gles; D Z G an Azimuth lying between theſe cardinall p[illegible] repreſenteth any declining plane, which is alſo perpend[illegible] to the Horizon, but cutteth the Meridian at oblique angle[illegible] whence the Poles and axis of the plane C Z V deviateth a[illegible] as the plane it ſelfe D Z G declineth from the prime ver[illegible] and theſe be all the varieties of erect planes.

There are furthermore three ſorts of reclining and inc[illegible] planes, and they are either North and South reclining, o[illegible] and Weſt reclining, or declining reclining.

The firſt ſort is repreſented by the Equator, or prickt[illegible] E K W, which cutteth the Meridian at right angles, but[illegible] neth from the Zenith 51 d. 32′, equall to the latitude[illegible] place, and lying open to the North, and the Poles thereo[illegible] North part of the Meridian, is therefore called a Nort[illegible] ning 51 d. 32′ from Z to K, and ſuppoſe this circle bei[illegible] ned over, to fall between N and Z, it then repreſenteth[illegible] reclining as much. The ſecond ſort is repreſented by the[illegible] of poſition, or prickt circle N O S, which cutteth the pri[illegible] ticall at right angles, but reclineth from the Zenith 40 d.[illegible] ing open to the Sunne-riſe, and the Poles thereof in th[illegible] part of the prime verticall, is therefore called an Eaſt re[illegible] 40 d. from Z to O, and ſuppoſe this circle being turned o[illegible] fall between Z and E, it then repreſenteth a Weſt recli[illegible] much.

The third ſort is repreſented be the prickt circle D A G[illegible] cutting C Z V the Azimuth and axis of the plane D Z G[illegible] angles in A, is oblique to all the reſt of the circles, but re[illegible]


I
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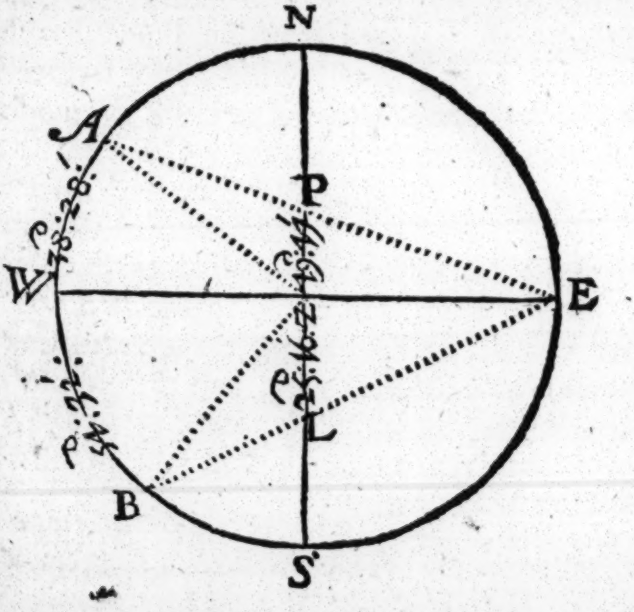
from the Zenith 35 d. and lying open to the North as the
mer, and the Poles thereof in the Northern part of the hea
is therefore called a North reclining 35 d. from Z to A,
the Azimuth passing by the Poles of the plane CV, decli
30 d. from N and S, to C and V, and suppose this circle b
turned over, to fall betweene C and Z, it then represent
South reclining declining as much.

The inclining planes of all sorts are but the opposite sid
the reclining, being the same counted from the zenith &
or their complements, reckoned from the Horizon, and a
presented by the very same circles, the reclination and in
tion of both being arches of the same Azimuth, passing b
Poles of the plane, comprehended betwixt the Zenith or
and the plane, as is Z K for the North direct, Z O for th
direct, and Z A for the North declining, so that wha
shall be sayd of the one, may also be understood of the ot
spectively. The jacent plane or horizontall is represen
the limb or outward circle of the Scheme N E S W.

Lastly, the circles crossing each other in the point
continued to the horizon, are the Meridians or houre-cir
suing from the North Pole, and properly intersecting the
sides of the planes E Z W and D Z G, whensoever th
you deale with South planes, you may turne the Scheme
and suppose P to bee the South Pole, and E Z W to bee a
plane, which before was a North, or else invert the orde
sides and houres, taking the East side for the West, &c.
will serve the turne as it stands.

The making of this Scheme is easie; take 60 d. of th
chord AB, and with that semidiameter draw the circle N
crosse it at right angles in Z, with the lines N Z S, and E
that done, seeke the place of the Pole at P, thorow wh
houre-circles must passe; the Equinoctiall point at K, th
picks at *t* and F, the reclining circle at O, and the decli
clining at A; all which may bee found with respect to
nith or horizon. The Zenith in the materiall Sphere is t
of the Horizon, and Z in the Scheme is the center of th
representing the same, from which point the distance
circle being given both wayes, as it lyeth in the sphere,

pon the azimuth, or ſtreight line of the Schem proper thereunto, you may by helpe of the naturall tangents of halfe their rches give three points to draw each circle by ; but if the naturall tangents of both diſtances from the Zenith bee added together, the balfe thereof ſhall bee the ſemidiameters of thoſe ircles deſired. The reaſon why the naturall tangents of halfe he arches are here taken, which ſeldome come in uſe, may bee nade plaine by this diagram, wherein making E *Z* the radius, Z N is a tangent line thereunto, upon which if you will proect the whole ſemicircle S W N, it is manifeſt by the worke, hat every part of the lines Z N, or Z S, can bee no more but the ngent of halfe the arch deſired, becauſe the whole line Z N, or S, being the tangent of 45 d. but halfe of the quadrant is equall the Radius Z E the ſine of the whole quadrant: but a further aſon may be given out of the 53 of the 1 of *Pitiſcus*, or the 20 f the 3 bo. of *Euclid*, where it is proved, that all angles in the rcumference are but halfe the angles in the center, and therere W E A but halfe the angle of W Z A, and W E B but halfe f W Z B ; if then E Z of the fundamentall Schem bee Radius 000, Z P ſhall bee 349 the naturall tangent of 19 d. 14′ the



 halfe

halfe of 38 d. 28′, the distance between the North Pole and Zenith, in our latitude of 51 d. 32′, and Z K shall be 483 the naturall tangent of 25 d. 46′ the halfe of 51 d. 32′ the distance between the Zenith and Equinoctiall, equall to the heigth of the Pole ; in like manner Z t will be 249 the naturall tangent of 14 d. 0′ 1/3, Z F will be 765 the naturall tangent of 37 d. 26′, will be 364, the naturall tangent of 20 d. 0′, and Z A 315 the naturall tangent of 17 d. 30′ halfe the arch of each circles distance from the Zenith. Having found these points on the one side of the Zenith, you must seeke the opposites to them on the other side also, which in all great circles, as are E P W, E K W, S and D A G, are the complements of the former to 90 d. wherefore the distance between the Zenith and the North Pole is 349 the naturall tangent of 19 d. 14′ halfe the arch of 38 d. the distance between the zenith and the South Pole shall be 2866, the naturall tangent of 90 d. 46′, the complement of the former ; halfe the arch between the zenith and South Pole being 90 d. and the South Pole 51 d. 32′ under the horizon adde these two tangents together, and you have the whole diameter of that circle 3215 the halfe whereof is 1607, that is radius and neere 61 hundred parts of another, is the semidiameter or distance of the center L from the Pole P, to which open the compasses, and set off the distance P L either by the line A 10, B 10, equall to the radius Z E, divided by diagonall lines into 100 parts, (as in the 1 Chapt.) or by the line of a sector, opened to the width of Z E, and therewith draw the circle W P E, for the six of clock houre. Thus may you the North and South distance of the Equator from the zenith finde the semidiameter of the circle to bee K d 1277, and the center thereof at d. In like manner the semidiameter of the declining circle N O S to be so 1555, and the center thereof the semidiameter of the declining reclining circle D A G, A g, and the center thereof at g, and so may any other great circle whatsoever be drawn.

Now as you have found the semidiameters of these circles by their distances from the zenith, so may you also finde the their inclinations to the horizon : for seeing the naturall tangent of any arch, and halfe the complement thereof to 90 d. is

[f]ore equall both to the secant of the said arch, and also to the [se]midiameter of the circle desired, by the 30 of 5 b. of *Finkius*, [Ge]*om. Rotondi*, you may easily prepare a table, (as in this exam[pl]e) wherein the secants themselves of each circles inclination [to] the horizon, are the semidiameters sought for; so shall 1607 [th]e secant of 51 d. 32′, the inclination of the six of clock houre-[cir]cle to the horizon, be the semidiameter LP, by which to draw [th]at circle W P E, and 1277 the secant of 38 d. 28′, the inclina-[tio]n of the Equator to the horizon, shall bee the semidiameter [d]K, by which to draw the circle W K E, and so of all great cir-[cle]s, but not of the smaller.

[D]eclinate from the zenith.	The arches.	Inclinate to the horizon.	The arches.	Their Secants.	The semidiameters.
Z P	38 d. 28′	P N	51 d. 32′	1607	L P
Z K	51 32	K S	38 28	1277	d K
Z O	40 0	O W	50 0	1555	f O
Z A	35 0	A V	55 0	1743	A g
Z *t*	28 1	*t* S	61 59	2129	*t* R
Z F	75 3	F S	14 57	1035	F I

The Tropick of ♋ is distant from the zenith on the South [sid]e 28 d. 1′, the halfe thereof is 14 d. 0′ $\frac{1}{2}$, the naturall tangent [t]hereof 249 being set from Z to *t*, giveth the point *t* in the [m]eridian, by which that paralell must passe; on the North side it [is] distant Z N 90 d. and under the horizon 14 d. 57′ more, the [w]hole distance is 104 d. 57′, the halfe whereof is 52 d. 29′ $\frac{1}{2}$, [an]d the naturall tangent thereof 1302, added to the former tan-[ge]nt 249, giveth the whole diameter of that circle 1551, whose [ha]lfe 776 is the semidiameter *t* R desired, and R the center to [dr]aw that circle by. Thus may you finde the naturall tangent [o]f Z F for ♑ to bee 768 on the South side, and on the North side [4]006, therefore the whole diameter 4768, and the halfe thereof [2]384 the semidiameter F I, by which to draw the Tropick of ♑ [I] F 4, and thus may any other paralell be likewise drawn. The [ci]rcle B R Q representeth an almicanter of 35 d. above the ho-

rizon, therefore 55 d. from the zenith, whose halfe is 27 d. and the naturall tangent thereof 520, which taken of the [...] or line divided as aforesaid, giveth the length of Z B, or the semidiameter of the almicanter desired. The streight C Z A, or D Z G, are put upon the limb, by help of the [...] 30 d. distant from the cordinall points N E S W, and must [...] each other at right angles in Z, representing two azimuth [...] quidistant from the Meridian and prime verticall.

Last of all, the houre-circles are thus to be drawn; first the center of the six of clock houre circle as formerly dire[...] whose distance from P or E will alwayes bee the secant [...] heigth of the Pole, making Z E the radius, and is found at [...] on the meridian line continued by setting the secant of 51 [...] from P to L, which crosse at right angles in L, with the [...] 8 L 4, extended farre enough to serve the turne; make P [...] radius, then shall 8 L 4 be a tangent line thereunto, and the [...] turall tangents of the Equinoctiall houre arches, *vizt.* of 2[...] 15 d. of 577 for 30 d, of 1000 for 45 d, of 1732 for 60, [...] 3732 for 75 d, set both wayes from L to 5 and 7, 4 and [...]

This Demonstration I received from my worthy friend, the famous Mathematician of our time, Mr. Henry Briggs.

ive the true centers of those houre circles, and the secants of
0115 for 15 d, of 1155 for 30 d, and of 1414 for 45 d, &c. equall
to 5 P, 4 P, &c. shall bee the semidiameters of the houre circles
desired; as by this demonstration may appeare. Let the instance
be in the second houre from six C D P E, whose center will bee
found two houres distant from 12, make P A the radius, then
shall A B be a tangent line thereunto, and 577 the naturall tangent
of 30 d. set from the point A, shall give the center at B,
and B P 1155 the secant of 30 d. shall be the semidiameter of the
circle C D P E. To prove this, the center must of necessity be
in the line D Z B, because it is perpendicular to the subtense of
that houre circle C Z E, suppose in B, then must B C, B P,
and B E be equall, which cannot be denied, if their squares bee
equall, but the square of B E is equall to the squares of E Z, Z A,
and A B, and the square of B P is equall to the squares of F Z,
Z A, and A B, because A F, and A P, are equall: lastly, Z E, and
Z F, are also equall, therefore the squares of B E, and B P, and
by the same reason of B C, which was to be proved, and consequently
the point B the true center, and B P the semidiameter,
by which to draw the periphery C D P E, the houre desired.
The schem, the sines, and circles thereof, being thus made plaine,
we now come to the Art of Dialling it selfe, which is first contracted
into a few generall rules, and then the particulars handled
at large.

CHAP. V.

An abstract of the Art of Dyalling, by which briefe view of the severall Planes, and what is requisite in every of them, the rest of the work is better understood, and more easily performed.

ALL great circles of the Sphere projected upon any plane howsoever situated, become steight lines, which are the common sections of the circles and the plane, (as *Clavius* in the 11 of his first booke of *Gnomonices* demonstrateth) from whence it followeth, that the houre lines of every Dyall, (being great circles of the Sphere) drawn upon any

any plane ſuperficies, muſt therefore be ſtreight lines alſo.

Now the Art of Dialling conſiſteth in the artificiall fin[ding] out of theſe lines, and their diſtances each from other, w[hich] continually vary, according to the ſituation of the plane, [on] which they are projected.

Of theſe planes there are but 3 ſorts, the

- 1, Paralell to the horizon, as is the horizontall onl[y].
- 2, Perpendicular to the horizon, as are all erect planes, which either be
  - Direct, as
    - North and South, and East and Weſt.
  - Or declining.
- 3, Inclining to the horizon, or rather reclining from the zenith, which are either
  - Direct planes, as
    - Reclining and inclining North and South.
    - and
    - Reclining and inclining East and Weſt.
  - Or declining reclining and inclining planes.

To contrive the houre lines upon theſe ſeverall planes, [there] are certain ſphericall arches, and angles of great circles, in [num]ber ſix, which muſt of neceſſity bee known, and divers of [them] are in ſome Caſes given, in others they are ſought.

1 The firſt is an arch of the horizon betwixt the me[ridian] and azimuth, paſſing by the poles of the plane, which is th[e de]clination, as S D, or N C, in the Schemes, Chap. 15. 17, 18.

2 The ſecond is an arch of a great circle, perpendicular t[o the] plane, comprehended betwixt the zenith and the plane, w[hich] is the reclination, as Z H, Z G, and Z E, in the greater Sch[eme] Chap. 15, and theſe two are uſually given, ſo oft as they [come] in queſtion, or may be found by the rules of the 10 Chap.

3 The third is an arch of the plane, betwixt the meridia[n and] the horizon, preſcribing the diſtance of the 12 of clock [...]

om the horizontall line, as P B, and O B, in the lesser Schemes, hap. 15, and 16.

4 The fourth is an arch of the plane, betwixt the meridian nd the substile, which limits the distance thereof from the 12 clock houre line, as O R in the smaller Schemes of the 16, 17 nd 19 Chap. aforesaid.

5 The fift is an arch of the great circle, perpendicular to the lane, comprehended betwixt the pole of the world, and the lane commonly called the heigth of the stile, as P R in the sayd chemes.

6 The last is an angle at the pole, betwixt the two meridi-s, the one of the place, the other of the plane, (taking the sub-ile in the common sense for the meridian of the plane) as is P O, in the diagrams of the Chap. 16 and 17.

First sort horizontall.

In the first sort of these planes, there is nothing required, but e arch of the meridian, betwixt the pole and the plane, which the heigth of the pole it selfe above the horizon, and is al-ayes given, as P N in the Schem, Chap. 6.

Second sort East and West.

In the second sort of planes, the direct East and West have o pole elevated, nor any of these arches necessarily required, t the houre lines being paralels, are contracted, and enlarged om the length of the stile.

North and South.

In the North and South planes, the arch of the meridian be-ixt the pole and the plane, is the complement of the former, twixt the pole and the horizon, which is therefore given, as Z in the former Schem of the 6 Chap. and the arch of the ho-zon, betwixt the meridian and the plane, is awayes 90 d. as W, or S E, in the Schem aforesaid.

Decliners.

But in erect decliners, three things are to be sought, besides e arch of the horizon, betwixt the meridian and the poles of e plane, which is the declination, and is usually given.

1 The first is the arch of the great circle betwixt the pole of e world and the plane, commonly called the heigth of the

stile,

ſtile, as P R in the ſchem, Chap. 10, and is thus found.

As the whole ſine Z S in the ſame ſchem,
Is to the coſine of the declination S G,
So is the coſine of the elevation Z P.
To the ſine of the heigth of the ſtile P R, by the 1 of the 1[illegible] R. S. Triangles.

2 The ſecond is the arch of the plane betwixt the meri[dian] and the ſubſtile, as *Z R* in the ſame ſchem.

As the cotangent of the declination S G,
Is to the tangent of the heigth of the ſtile P R,
So is the whole ſine G Z,
To the ſine of the arch of the plane R Z, the diſtance of the [meri]dian and ſubſtile, by the ſecond of the fourth caſe of R. S. [Tri]angles.

3 The third is the angle betwixt the two meridian[s] one of the place, the other of the plane, as *Z P R* in the ſchem.

As the coſine of the elevation P Z,
Is to the ſine of 90 d. P R Z,
So is the ſine of the arch of the plane betwixt the ſubſtile an[d me]ridian R Z,
To the ſine of the angle at the pole betwixt the two meri[dians] Z P R, by the ſecond of the fifteenth caſe of R. S. Triangl[es].

Third ſort.

In the third ſort of planes, the direct reclining Nort[h] South, have the arch of the horizon betwixt the meridia[n] the plane, and the arch of the plane betwixt the meridia[n] horizon, alwayes 90 d. as is S E, or N W, and A E, or B[...] the ſchem Chap. 13. and the inclination of the plane to th[e ho]rizon N E A, or the reclination thereof from the zenith [...] is uſually given, only the arch of the meridian betwixt th[e ...] and the plane is ſought for.

South recliners.

The ſame in South recliners is found by ſubtracting the [recli]nation out of the complement of the elevation, when it is [...] (as *Z C* out of *Z P*,) or the complement of the elevatio[n ...] of it, (as *Z P* out of *Z A*,) when it reclines more than the [...]

North recliners.

But in North recliners how farre soever, adde the complement of the elevation to the reclination, (as *P Z* to *Z F*) the aggregate under 90 d. or the complement thereof to 180 d. above 90 d. is the heigth of the pole desired.

East and West reclining.

Indirect reclining East and West, the arch of the horizon betwixt the meridian and the plane, is alwayes 180 d. as is S W N, or N E S in the schem Chap. 12. and the angle of inclination of the plane to the horizon W N O, or the reclination thereof from the zenith, which is an arch of the prime verticall Z O, is usually given, therefore we seeke,

1 The arch of the great circle, betwixt the pole of the world and the plane, which is the heigth of the stile P R in the schem aforesayd.

As the whole sine N Z,
Is to the sine of the elevation N P,
So is the sine of the reclination Z O,
To the sine of the heigth of the stile P R, by the first of the first case of R. S. *Triangles.*

2 The arch of the plane betwixt the meridian and the substile, as is N R in the schem aforesayd.

As the tangent of the reclination Z O,
Is to the tangent of the heigth of the stile P R,
So is the whole sine O N,
To the sine of the arch of the distance of the substile from the meridian R N, by the second of the fourth case of R S. *Triangles.*

3 The angle betwixt the two meridians, which is R P N in the said schem.

As the sine of the arch of the meridian betwixt the pole and the horizon P N,
Is to the sine of 90 d. P R N,
So is the sine of the arch of the plane betwixt the substile and the meridian R N,
To the sine of the angle at the pole betwixt the two meridians R P N, by the second of the fifteenth case of R. S. *Triangles.*

Declining reclining.

In declining reclining planes let the arch of the horizon betwixt

twixt the meridian and the poles of the plane, S D and N C or N D and S C which is the declination, and the arch of the great circle, perpendicular to the plane, betwixt the zenith and the plane *Z G, Z H,* or *Z F,* which is the reclination, (as in the smaller schemes, Chap. 15, 16, and 17.) bee alwayes given then must the other arches and angle be sought.

1 The arch of the plane betwixt the meridian and horizon P B, and O B, in the schemes aforesaid, and *A a,* and *A O,* in the smaller schemes, Chap, 18, 19, 20.

As the whole sine Z C in the South, and Z D in the North decliners,
Is to the tangent of the declination C S, or C N in South, *and D N in North,*
So is the sine of the reclination Z G, Z H, or Z F in both,
To the tangent of G P and G a, H O or F O in both, whose complements P B and O B, A a and A O are the arches desired by the first of the fift case of R. S. *Triangles.*

Polar decliners, and Equinoctiall decliners.

2 The arch of the meridian betwixt the zenith and the plane which in polar decliners (whose planes passe by the intersection of the equator and meridian) is equall to the heigth of the pole and in equinoctiall decliners (whose planes passe by the poles of the world) is the complement thereof, as is *Z a* Chap. 16 and *Z P* in the lesser schem Chap. 15, in all the rest it is thus found.

As the cosine of the declination S *B and N B in the* South, *or A N in the North decliners,*
Is to the sine of the arch of the plane betwixt the meridian and horizon O B or A O in both,
So is the sine of the reclination Z H or Z F in both,
To the sine of the arch of the meridian betwixt the zenith and the plane Z O in both, by the fifteenth of the fourth of Regiomontanus *or the second of the fourteenth of* Finkius.

Adde Z O to Z P in North decliners, and take Z O out of Z P, or Z P out of Z O (when there is cause) in South decliners and there remaines P O in them all, the arch of the meridian betwixt the pole of the world and the plane.

3 The arch of the great circle betwixt the pole and the plane common

commonly called the heigth of the ſtile, as is P R in the former ſchemes, which in equinoctiall decliners is paralell to the axis, in the reſt is thus found.

As the ſine of the arch of the plane betwixt the meridian and horizon O B in the South, and A æ and A O in North decliners,
Is to the coſine of the declination B N and B S in South, or A S in North decliners,
So is the ſine of the arch of the meridian betwixt the pole and the plane O P, and æ P in both,
To the ſine of the heigth of the ſtile P R in both, by the fifteenth of the fourth booke of Regiomont. *or the ſecond of the fourteenth of* Finkius.

4 The arch of the plane betwixt the meridian and the ſubſtile, as O R and æ R in the former ſchemes, which in polar decliners is alwayes 90 d. and in equinoctiall decliners is alwayes equall to the angle, between the two meridians, is thus found.

As the whole ſine,
Is to the ſine of the latitude,
So is the tangent of the declination,
To the tangent of the angle between the two meridians.

In all the reſt thus.

As the cotangent of the declination B N and B S in the South, or A S in the North,
Is to the tangent of the heigth of the ſtile R P in both,
So is the coſine of the arch of the meridian betwixt the zenith and the plane N O, or S O, and S æ in both,
To the ſine of the arch of the plane betwixt the meridian and ſubſtice R O and R æ in both, by the thirteenth of the fourteenth of Finkius.

5 The angle betwixt the two meridians O P R in the foreſaid ſchemes, is found by this one generall rule in all kindes.

As the ſine of the arch of the meridian betwixt the pole and the plane P O and P æ,
Is to the ſine of 90 d. *P R O, and P R æ,*
So is the ſine of the arch of the plane betwixt the ſubſtile and meridian O R, and æ R,
To the ſine of the angle betwixt the two meridians O P R, by the firſt and ſecond of the fifteenth caſe of R S. *Triangles.*

These

These things being found, the houre lines for all kinde planes are calculated by these two Canons:

The first for all paralell houre lines, is the second case of plane Triangles.

As the Radius,
Is to the length of the stile in any known parts,
So is the tangent of each houres equinoctiall distance from the sub-stile,
To the same houres distance upon the equinoctiall in parts of the stile.

The second serves for all the rest, which is the first of the fift case of *R.S.* Triangles.

As the whole sine,
Is to the sine of the heigth of the pole above the plane,
So is the tangent of each houres distance from the substile upon the equinoctiall,
To the tangent of the same houres distance from the substile upon the plane.

Thus have you for more readinesse sake the whole doctrine of *Dialling* contracted into a sheet of paper.

I now come to the making of the particular Dials, in number 25, as *Wittakindus* and others following him have reckoned them, which *Clavius* in the second Chapter of his *Gnomonices* reduceth to 17, denominating the planes and Dials from nine great circles of the Sphere, to which they are parelell, and allowing to every plane two faces, except the horizontall; but because the Diall of each face of every plane is one and the same (by which reason there should bee but nine sorts of Dials) and that the divers situation of the same kinde of planes enforceth a differing projection of the houre lines, as they are right, oblique, or paralell to the axis of the world, I retaine the number, but take liberty to depart from the division. And further, I denominate each Diall and plane from the site of the axis, and respect of the poles thereof, it being most agreeable in all (but the horizontall) to the vulgar names, by which they are best known; but chiefly because I finde that *Clavius* in the abovesaid Chapter is forced (for more plainesse sake) to do the same, who besides the paralellisme of each plane, describeth the erect plane

ythe ſite of their poles, the inclining planes by their reclinati-
n, and the declining inclining by the ſite of the poles and re-
ination, ſo hee calleth that plane whoſe face reſpecteth the
outh, but deviateth from the prime verticall Northward, a
outh declining Eaſt, which is the true ſituation of the pole
hereof, whereas it is manifeſt, that the plane it ſelfe declineth
much from the Eaſt Northerly, as the pole doth from the
outh Eaſterly, ſo he calleth inclining to the horizon, that which
ſpecteth the zenith, and the South or North parts, whereas all
eclinations looke down to the Nadir, and the reclining part
f the plane up to the zenith, wherefore I call the horizontall,
erticall, becauſe the pole thereof lieth in the vertix, or zenith of
he place; the verticals I call South and North direct, becauſe
he poles of the plane lie in the South and North part of the ho-
izon; the meridian plane I call Eaſt and Weſt direct, becauſe
he poles thereof lie in the Eaſt and Weſt part of the horizon;
e equinoctiall I call polar, becauſe the poles of that plane lie
the poles of the world; and the polar I call equinoctiall, be-
auſe the poles thereof lie in the equinoctiall, and ſo of the reſt.
aſtly, I call all planes whoſe upper faces reſpect the zenith, re-
liners, and only their oppoſites incliners, whoſe nether faces
ook down to the Nadir.

The names and number of the Dials, are as followeth.

1 *Verticall, or Horizontall.*
2 *South and North direct.*
3 *Eaſt and Weſt direct.*
4 *South and North declining Eaſt or Weſt.*
5 *Eaſt and Weſt direct reclining or inclining.*
6 *Equinoctiall or South reclining, or inclining to the pole.*
7 *South direct reclining, or inclining leſſe* }
8 *South direct reclining or inclining more* } *than the pole.*
9 *Polar, or North reclining, or inclining to the equator.*
10 *North direct reclining, or inclining leſſe* } *than the*
11 *North direct reclining, or inclining more* } *equator.*
12 *Equinoctiall, or South declining Eaſt or Weſt, reclining or inclining to the pole.*

13 *South declining East or West, reclining or inclining* [...] *the pole.*

14 *South declining East or West, reclining or inclining* [...] *the pole.*

15 *Polar, or North declining East or West, reclining* [...] *clining to the intersection of the meridian and equ*[...]

16 *North declining East or West, reclining or inclining* [...] *the intersection of the meridian and equator.*

17 *North declining East or West, reclining or inclining* [...] *the intersection of the meridian and equator.*

Note that in the making the particular Dials, I do some[...] differ from these generall Canons, for varieties sake.

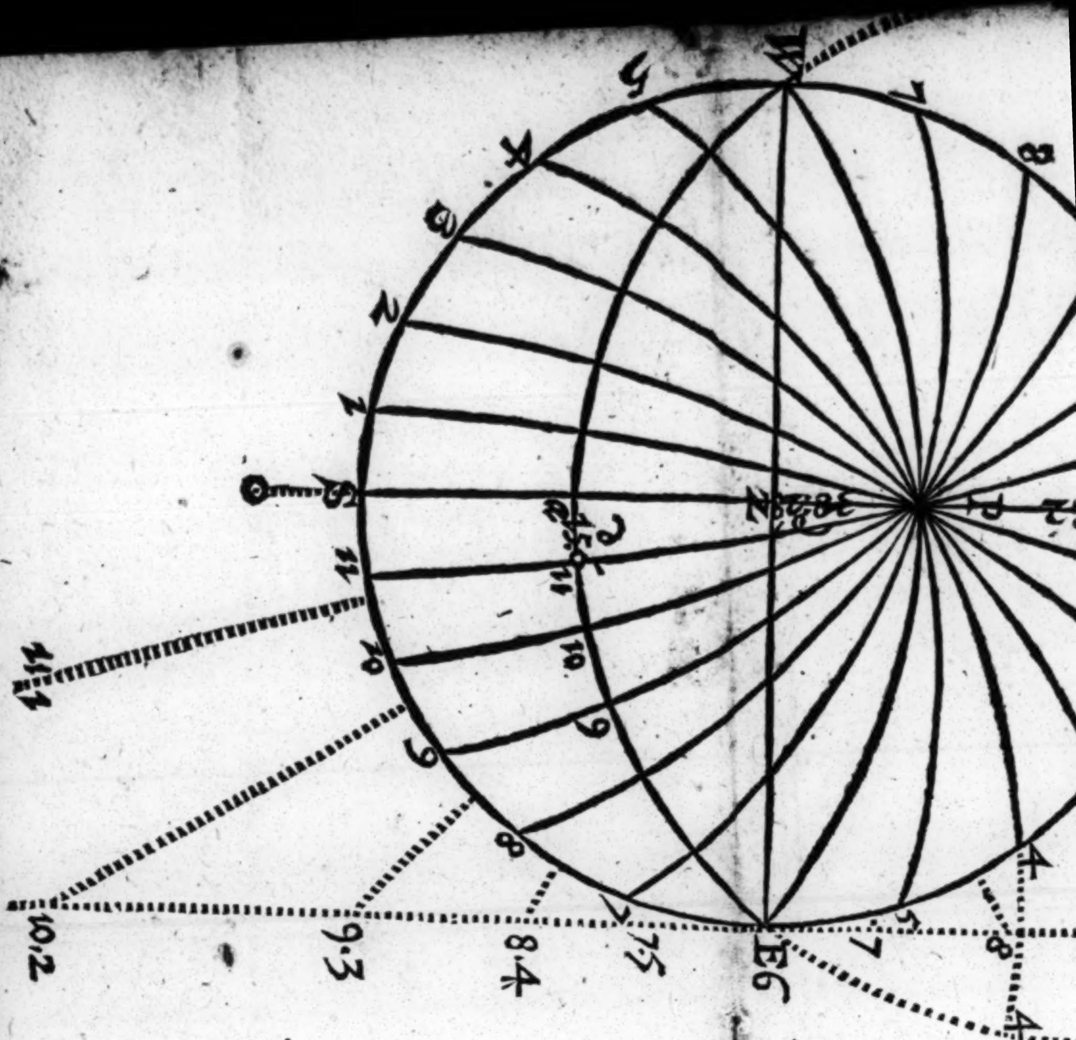
CHAP. VI.

To draw the houre lines upon the verticall, commonly call[...] *horizontall plane, the elevation of the pole being given.*

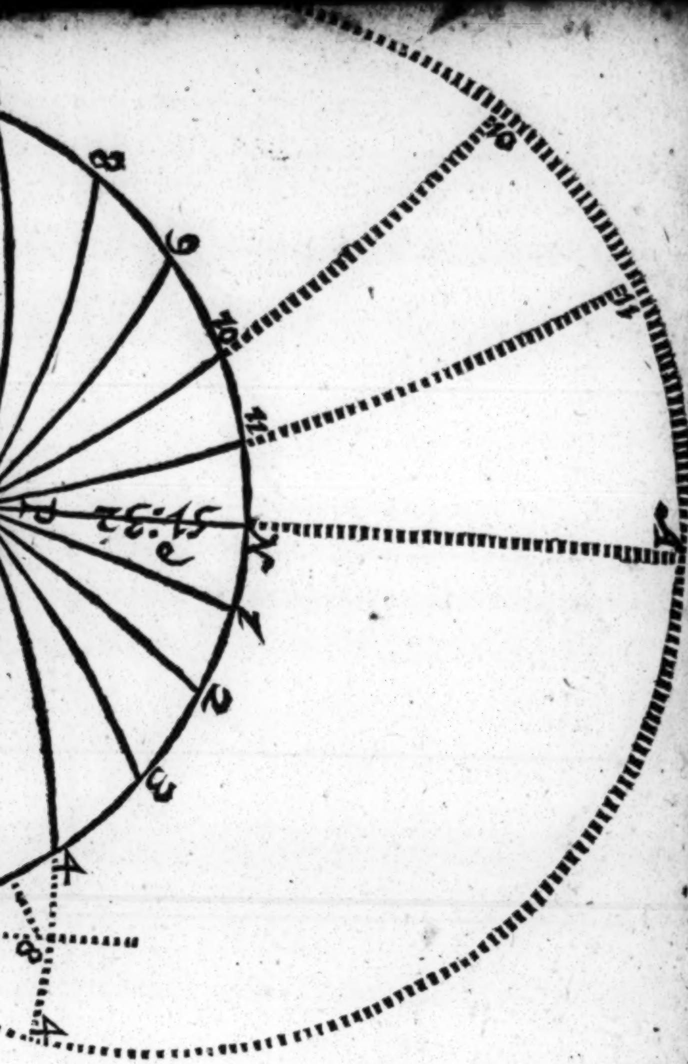
THis plane, in respect of the poles thereof, w[...] lie in the vertex and nadir of the place, m[...] called verticall; in respect of the plane it[...] which is paralell to the horizon, horizo[...] Howsoever it be termed, the making o[...] Diall is the same, in which first sort (as app[...]eth by the abstract) there is but only one arch of the me[...] betwixt the pole of the world and the plane required to t[...]tificiall projecting the houre lines upon the same, which [...] the heigth of the pole above the horizon (equall to the heig[...] the stile above the plane) is alwayes given, by the help wh[...] we may presently proceed to calculate the true houre dist[...] in manner following.

The Demonstration.

In this particular schem adjoyning, which is so much o[...] fundamentall schem as is pertinent to this purpose, let NE[...] be the horizon, N Z S the meridian, E Z W the prime verti[...] E æ W the equator, P the North pole, and Z the zenith, [...]



Place this folio 75.



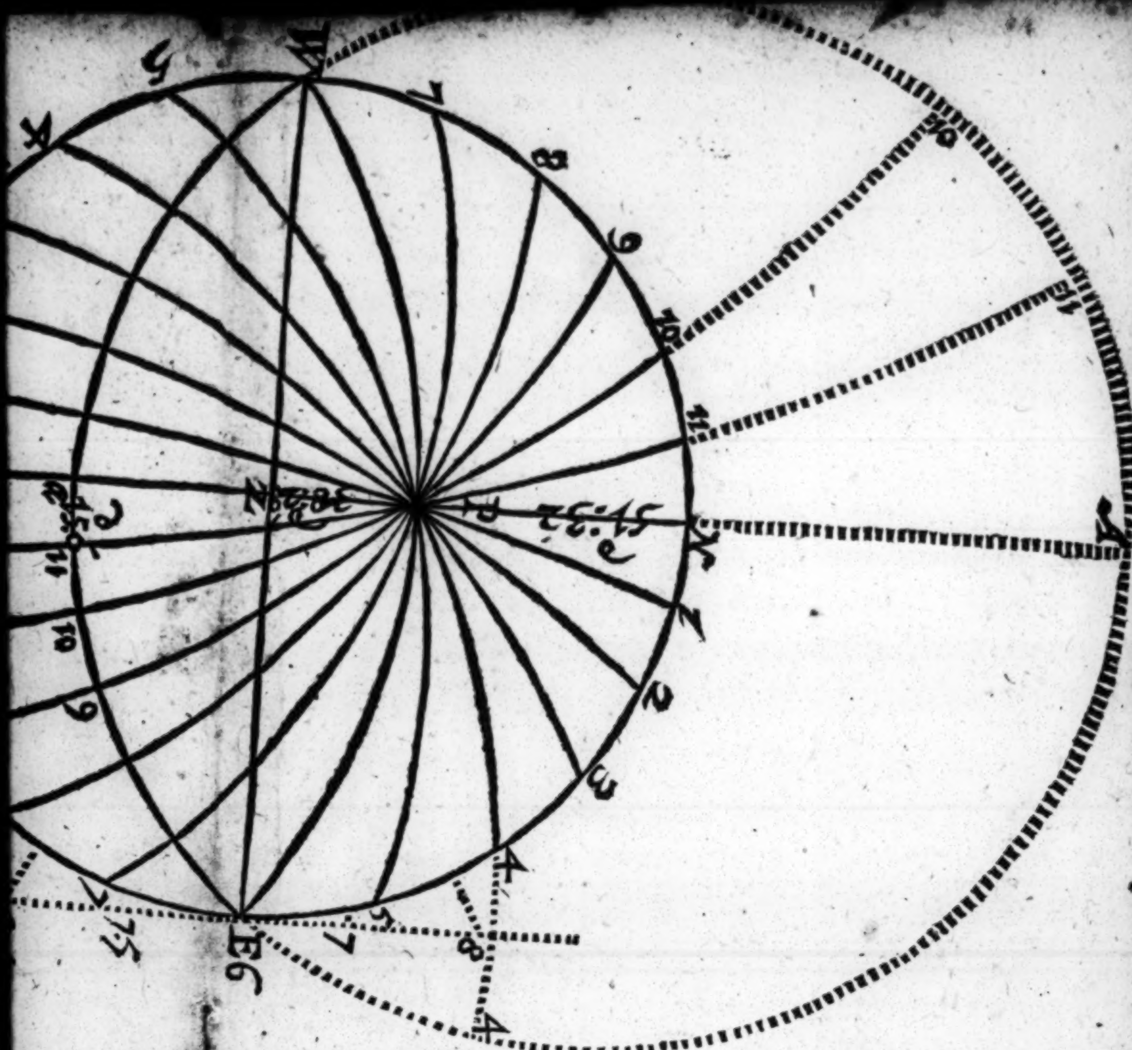
re circles crossing at P, fall u
,10, 9, 1; 2, 3, &c. limitin
m the meridian upon the pl
rizon N 11, N 10, N 9, &c.
P 11, SP 10, SP 9, or their v
y thus be found. Because ev
ke, you may begin with whi
ures distance either by the sn
adrantall A P 11, (supposing
ntinued, till they crosse each
the verticall triangles æ P 1
in the schem, such is the var
call calculation in the triangle
e heigth of the pole above th
leat P is given, one houres dis
easure in the equinoctiall A 1
or A is alwayes 90 d. where
se of right angled S. triangle

As the sine of P N 11
s to the tangent of the angle N
o is the sine of the side P N
To the tangent of the side N 11

Or againe, you may finde t
ngles together, N P 11, and
nd their like sides proportion

For as the sine of P æ	9
Is to the sine of P N	5
So is the tangent of æ 11	1
To the tangent of N 11	1

Seeke in the Canon at the e
9321.79 Logar. and you shal
to 11 d. 51′ for the first hour
de of the meridian, and thus



Place this folio 75.

[ho]ure circles crossing at P, fall upon the horizon at the ointsp fo [1]1, 10, 9, 1; 2, 3, &c. limiting the distance of each houre line [fr]om the meridian upon the plane, according to the arches of [h]orizon N 11, N 10, N 9, &c. which by the severall triangles [S]P 11, SP 10, SP 9, or their verticals N P 11, N P 10, NP 9, [ma]y thus be found. Because every quarter of the horizontall is [ali]ke, you may begin with which you will, and resolve each [ho]ures distance either by the small triangle N P 11, or by the [q]uadrantall A P 11, (supposing the equator and meridian to be [c]ontinued, till they crosse each other at A, without the limb) or [b]y the verticall triangles æ P 11, and N P 11, together as they [l]ie in the schem, such is the variety of triangles. The arithme-[t]icall calculation in the triangle P N 11. The side P N is given, the heigth of the pole above the horizon, 51 d. 32′, and the an-gle at P is given, one houres distance from the meridian, whose measure in the equinoctiall A 11, is 15 d. and the right angle at N or A is alwayes 90 d. wherefore by the first variety of the fift case of right angled S. triangles.

		Log.
As the sine of P N 11	90^{d}.0′	10000.00
Is to the tangent of the angle N P 11	15 0	9428.05
So is the sine of the side P N	51 32	9893.74
To the tangent of the side N 11	11 51	19321.79

Or againe, you may finde the same arch by help of both tri-[a]ngles together, N P 11, and æ P 11, because they be verticall, and their like sides proportionall.

		Log.
For as the sine of P æ	90^{d}. 0′	10000.00
Is to the sine of P N	51 32	9893.74
So is the tangent of æ 11	15 0	9428.05
To the tangent of N 11	11 51	19321.79

Seeke in the Canon at the end of the booke for the tangent, 9321.79 Logar. and you shall finde the arch answerable there-to 11 d. 51′ for the first houres distance off 1, and 11, on each [s]ide of the meridian, and thus must you in all respects finde the

distance of 2 and 10 of clock, by resolving the triangle N
by the same case, and of 3 and 9 of clock, by resolving th
angle N P 9, and so of the rest, wherein as the angle at P
creaseth, which for two houres is 30 d, for 3 houres 45 d,
houres 60 d, and for 5 houres 75 d, so will the arches of th
rizon N 10, N 9, N 8, and N 7, proportionally vary, and
each houres true distance from the meridian, which is the
desired, and because every 6 houres is 90 d. distance upon
equinoctiall each from other, you may at the same worke
11 and 5, 10 and 4, 9 and 3, 8 and 2, & 7 and 1 of clock, by
addition, and subtraction, or two additions at the most, w
will somewhat also shorten the work, as in this example
appeare.

		Log.
P A is	$90^{d}.\ 0'$	10000.00
A 10 the tangent of	30 0	9761.44
P N the sine of	51 32	9893.74
Which added to A 10		
Giveth the tangent of N 10	24 20	19655.1
But subtract A 10 out of the Radius and P N, there will come forth the tangent of N 4 at the same work	$53^{d}.36'$	10132.30

The reason whereof is manifest in the schem afore
wherein the equator being continued, to crosse the meridi
A, and the houre line the equator at 10, the proportion st
eth thus:

As the greater sine A P,
Is to the lesser sine N P,
So is the greater tangent A 10,
To the lesser tangent N 10,

which produceth 24 d. 20 for 10 of clock, by addition b
you put the radius in the second place, which you may ch
at pleasure, because it is meane proportionall between the t
gent of the arch, and complement, by the 25 of the 5 of Eu
then will the proportion be,

As the lesser tangent A 10,
Is to the greater sine A P,
So is the lesser sine P N,
To the geater tangent N 4,
which giveth 53 d. 36′, found by subtraction, for 4 of clock, being 6 houres distance from 10.

To perform this by addition only, the proportions bee the same for both houres.

			Logar.
For as the whole sine A P	90 d.	0′	10000.00
Is to the tangent of *A 10*	30	0	9761.44
or A 4	60	0	10238.56
So is the sine of P N	51	32	9893.74
To the tangent of *N 10*	24	20	9655.18
or N 4	53	36	10132.30

And thus having shewed divers wayes to calculate some of the houre distances, (which vary nothing at all from the rest) and also how the proportions are naturally deduced out of the schem, I will now shew a briefe way to obtaine your desire, which would have been both obscure and preposterous, without understanding the reason of the work, by the former directions.

First therefore prepare a table, according to the example adjoyning, wherein set down all the houres in order from 12, as they are equidistant from the meridian, *vizt.* 11 and 1, 10 & 2, 9 and 3, &c. unto them adjoyne the equinoctiall distances, that is, for the first houre 15 d, for the second houre 30 d, for the third, 45 d, and so of the rest, by continuall addition of 15 d. then take out of the Canon upon a loose paper, the Logarithme or artificiall sine of the elevation of the pole above this plane, which for 51 d. 32′, the heigth of the pole here at *London*, is 9893.7452, and is alwayes one of the middle proportionals; in finding out every houres distance, apply it to 9428.0524 the Logar. tangent of 15 d, in the booke, (which is the first houres equinoctiall distance) and adde them both together, there shall come forth a new Logar. tangent of 9321.7976 for that houres

 distance,

Houres.		Equinoct. distances.		The Logarith. of the tangents.	The true houre distances upon the plane.	Differ.
12	0	0d.	0'	0	0d. 0' 0"	
11	1	15	0	9321.7976	11.50.55	
10	2	30	0	9655.1845	24.19.29	12d.28' 34"
9	3	45	0	9893.7452	38. 3.35	13 44 6
8	4	60	0	10132.3058	53.35.43	15 32 8
7	5	75	0	10465.6927	71. 6.29	17 30 46
6	6	90	0	10000.0000	90. 0. 0	18 53 31
ante merid	post merid					

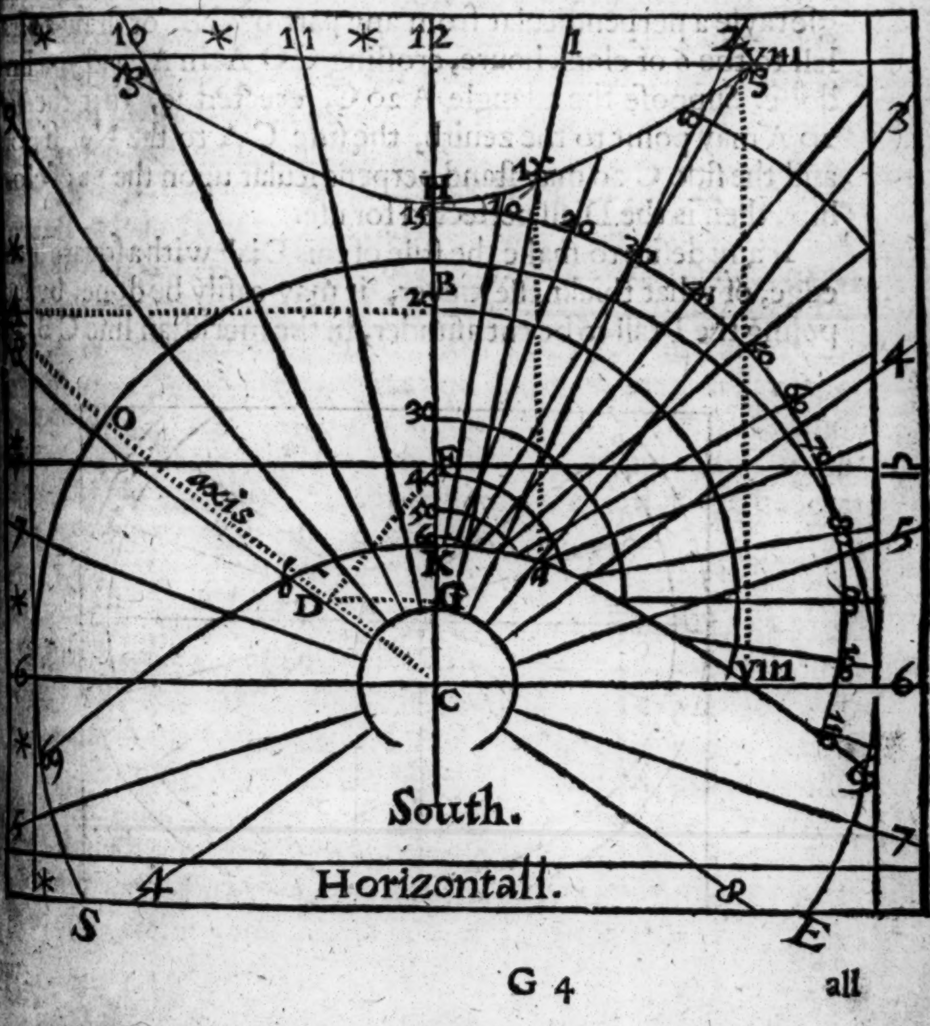
distance, which set down in the table by 15 d, in the same pl
remove your paper, to the Logar. tangent of 75 d. the compl
ment of 15 d. 10571.9475, and adde them both together, y
shall produce a new Logar. tangent of 10465.6927 for t
houres of 7 or 5, 90 d. distant from 11 and 1, which set do
in the table also by 75 d, do the like with the tangents of 30
and 60 d, for the houres of 10 and 2, and 8 and 4, for the ta
gents of 9 and 3 of clock you must set down in the table, t
artif. sine it selfe of 51 d. 32', *viz.* 9893.7452, because t
tangent of 45 d. that houres distance from 12, (being equall
the Radius) altereth not the sine at all; now seeke these seve
Logar. tangents in the Canon, and you shall finde the horizo
tall arches of each houres distance to be for N 11, and N 1, 11
51'; for N 10, and N 2, 24 d. 20'; for N 9, and N 3, 38 d. 4
for N 8, and N 4, 53 d. 36'; for N 7, and N 5, 71 d. 6'; t
houres 12 and 6 of clock, are two streight lines 90 d. dista
and the face crossing each other at right angles, as N *Z* S repr
senting the meridian, and E Z W representing the prime ver
call, do in the schem.

The table being thus prepared, you may examine the tr
of the work by the differences of the arches, for though th
do not equally vary, yet is there such a circular proportion o
served, that they neither alter suddenly, nor contrary one to a
nother.

Th

The Geometricall projection.

Now make the Diall, and first draw two streight lines B 12, and 6 C 6, crossing at right angles in C, upon the cen- C, at the distance of Z S of the schem, equall to A B 60 d. of lesser chord, make the circle E B O S representing the plane; off from B upon that circle both wayes (by help of the for- r chord) the houre distances, as they lie in order in the table, t. 11 d. 51′ for 11 and 1 of clock, 24 d. 20′ for 10 and 2 of ock, 38 d. 4′ for 9 and 3 of clock, and so of the rest. Thorow ese pricks draw streight lines from the center C, so have you

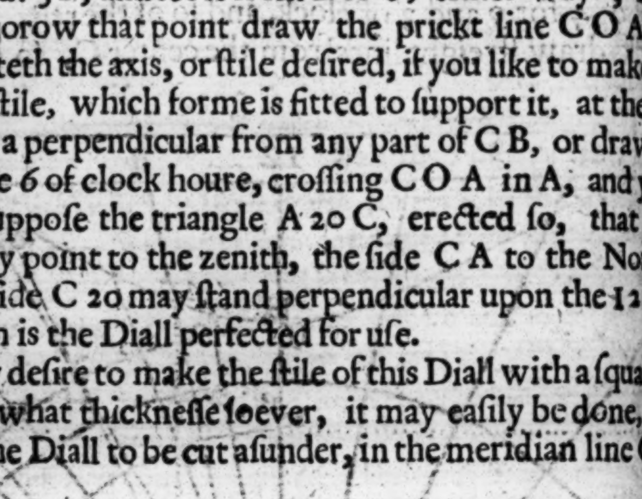


all the houres for this plane, except those which fall abov
6 of clock houre, which are no other but the fourth and fi
seventh and eighth, houre lines continued beyond the cent

The heighth of the stile 51 d. 32′.

For the heighth of the stile you need no calculation i
kinde of Diall, the heighth of the pole above the horizon
given, is the heighth therof, take therefore of the same cho
arch 51 d. 32′, and set it from B to O, either way ; fro
center thorow that point draw the prickt line C O A,
representeth the axis, or stile desired, if you like to make t
angular stile, which forme is fitted to support it, at the t
gle rayse a perpendicular from any part of C B, or draw
lell to the 6 of clock houre, crossing C O A in A, and you
done. Suppose the triangle A 20 C, erected so, that the
20 A may point to the zenith, the side C A to the North
and the side C 20 may stand perpendicular upon the 12 of
line, then is the Diall perfected for use.

If any desire to make the stile of this Diall with a square
edge, of what thicknesse soever, it may easily be done, by
posing the Diall to be cut asunder, in the meridian line C B,



East side separated from the West, the thicknesse of the ,A B D C, of this later schem, then shall all the houre lines er six remaine the same, only the houre lines of 5 and 4 in morning, and 7 and 8 in the evening, which before were wn thorow the center C of the first schem, at equall distan- above and under the 6 of clock houre, must now be drawn row the severall centers A and B of the second schem, and will become unequall, save with reference to their proper ters; notwithstanding, because the East edge of the stile weth the houres before 6, and the West edge thereof after the shadow shall give the true houre, as when both sides were awn thorow one and the same center: the azimuthes, almi- nters, paralels, &c. remaine the same without alteration, only *nodus* or notch in the stile, which traces out these lines, must made at the like distance on each side of the stile; the like y bee done in all other kindes of Dials, supposing the substile be devided, as here the meridian is.

Now if you desire to put into this Diall, or any of the rest atfollow, the halfe houres and quarters, their distances upon he plane are as easily found by the same rules, as the houres were, or by adding the Log. sine of the heighth of the pole unto the Log. tangents of 3 d. 45', 7 d. 30', and 11 d. 15', which are the e- quinoctiall arches of halfe houres and quarters, there will come orth the Log. tangents of new arches, proper to the halfes and quarters, as in the example appeareth, which being found in the anon, and put into the Dyall by help of the chord, as the houres were, you have done what was desired.

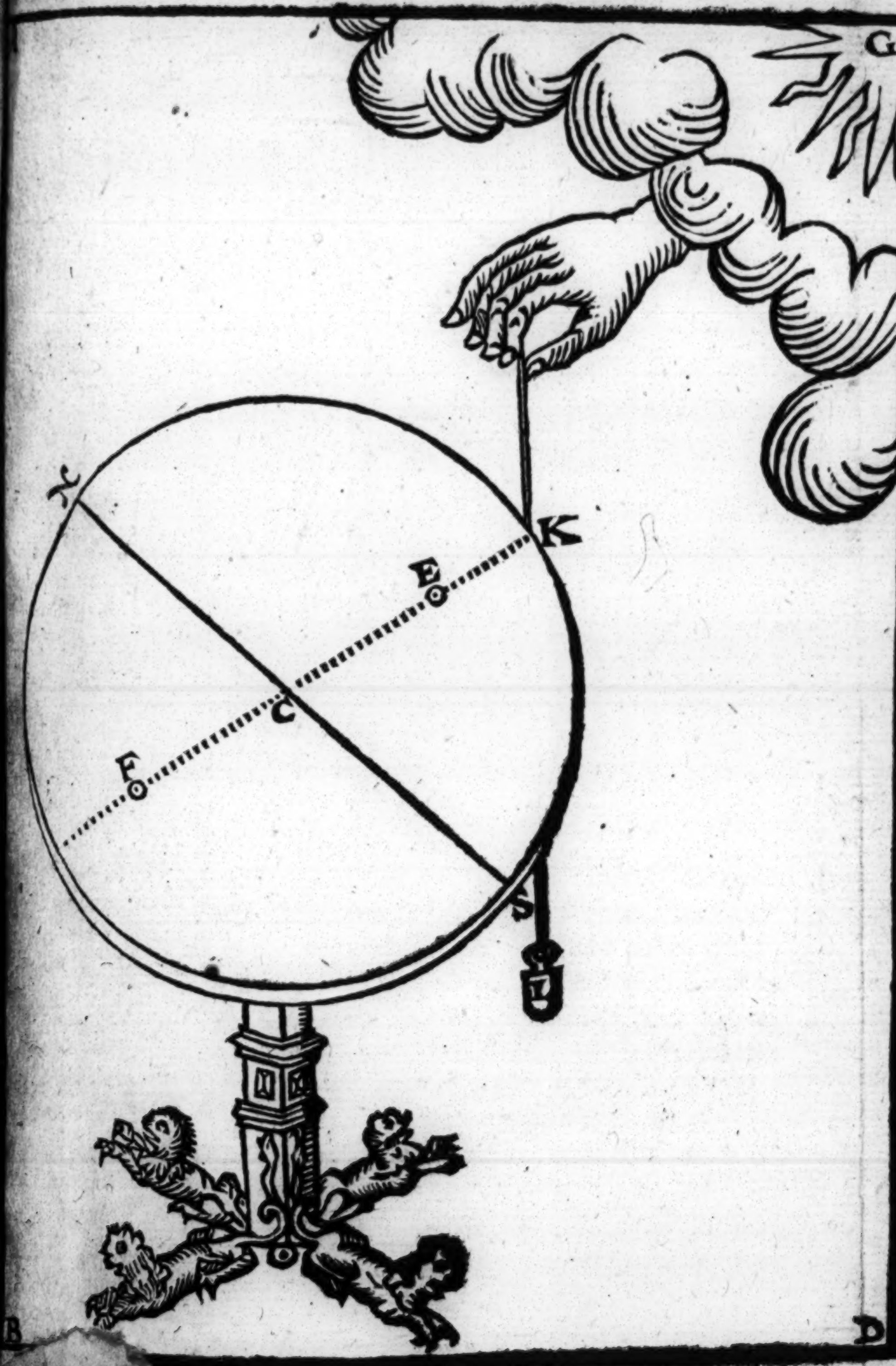
Hour.	Quart.	Equino. distance.	Logarith. tangents.	True ho. distance.	Differ.
12	0	0d. 0'	0000.00	d '	d '
	1/4	3. 45	8710.27	2.56	2.57
	1/2	7. 30	9013.17	5.53	2.58
	3/4	11.15	9192.40	8.51	3. 0
11	0	15. 0	0000.00	0. 0	3. 2
	1/4	18.45	9424.52	14.53	3. 5
	1/2	22.30	9510.96	17.58	3. 9
	3/4	26.15	9586.71	21. 7	3.13

Hour.	Quart.	Equino-distance.	Logarith. tangents.	True ho. distance.	Differ.
10	•	30d.0′	0000.00	0d. 0′	3.17
•	¼	33.45	9718.63	27.37	3.23
•	½	37.30	9778.72	31. 0	3.29
•	¾	41.15	9836.73	24.29	3.35
9	•	45. 0	0000.00	0 0	3.42
•	¼	48.45	9950.75	41.46	3.49
•	½	52.30	10008.76	45.35	3.56
•	¾	56.15	10068.85	49.32	4. 4
8	•	60. 0	0000.00	0 0	4.12
•	¼	63.45	10200.76	57.48	4.19
•	½	67.30	10276.51	62. 7	4.27
•	¾	71.15	10362.96	66.34	4.32
7	∘	75. 0	0000.00	0 0	4.39
•	¼	78.45	10595.08	75.45	4.42
•	½	82.30	10774.31	80.27	4.46
•	¾	86.15	11077.21	85.13	4.47

Now becauſe it is to little purpoſe to make the Dyall tru[e] leſſe you alſo place it true in the meridian, I think it fit in placeto ſhew the manner of finding a meridian line, at any [t] of the day, the Sunne ſhining.

Hold a thred with a weight at the end thereof, cloſe to plane, on which you purpoſe to ſet the Diall, repreſented the round table N K S ; make two pricks in the ſhadow of thred upon the plane, by which draw a ſtreight line, at the ſa[me] inſtant take the heighth of the Sunne, and by help thereof fi[nd] the azimuth of the Sunne, which (with the complement th[ere]of to 180 d.) being ſet Northwards, and Southwards, from line of ſhadow (in the circle S K N firſt drawn by a chord) [ac]cording to the time of obſervation ſhall give two points, which a ſtreight line drawn thorow the center C, repre[ſent]ing the zenith, ſhall be the true meridian line deſired.

Example, let the plane be N K S, the thred and weight K the ſhadowed line E C F, two pricks therein at E and F, heig[ht]

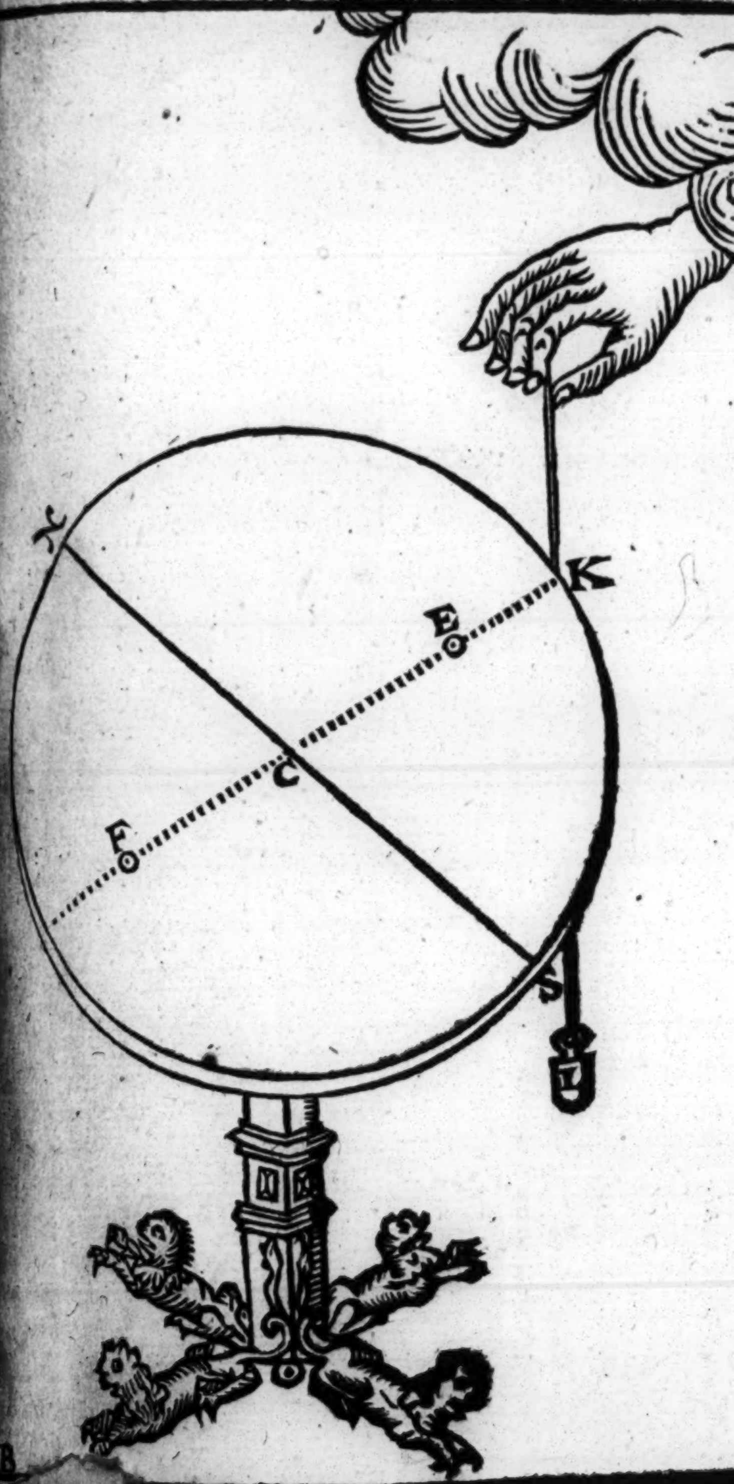


Place this folio 82

Logarith. tangents.	True ho. distance.	Differ.
0000.00	0d. 0'	
9718.63	27.37	3.17
9778.72	31. 0	3.23
9836.73	24.29	3.29
0000.00	0 0	3.35
9950.75	41.46	3.42
0008.76	45.35	3.49
0068.85	49.32	3.56
0000.00	0 0	4. 4
0200.76	57.48	4.12
0276.51	62. 7	4.19
0362.96	66.34	4.27
0000.00	0 0	4.32
0595.08	75.45	4.39
0774.31	80.27	4.42
1077.21	85.13	4.46
		4.47

urpose to make the Dyall true,
the meridian, I think it fit in
inding a meridian line, at any ti

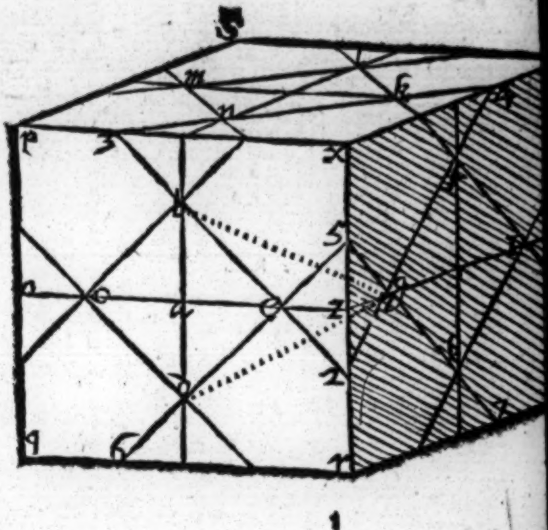
t at the end thereof, close to
to set the Diall, represented
e two pricks in the shadow of
h draw a streight line, at the sa
Sunne, and by help thereof fin
hich (with the complement the
wards, and Southwards, from
S K N first drawn by a chord)
ation shall give two points,
thorow the center C, represe
e meridian line desired.
N K S, the thred and weight K
o pricks therein at E and F,
heig

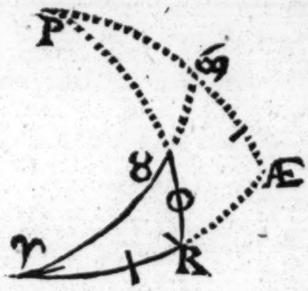


B

Place this folio 82


G
D

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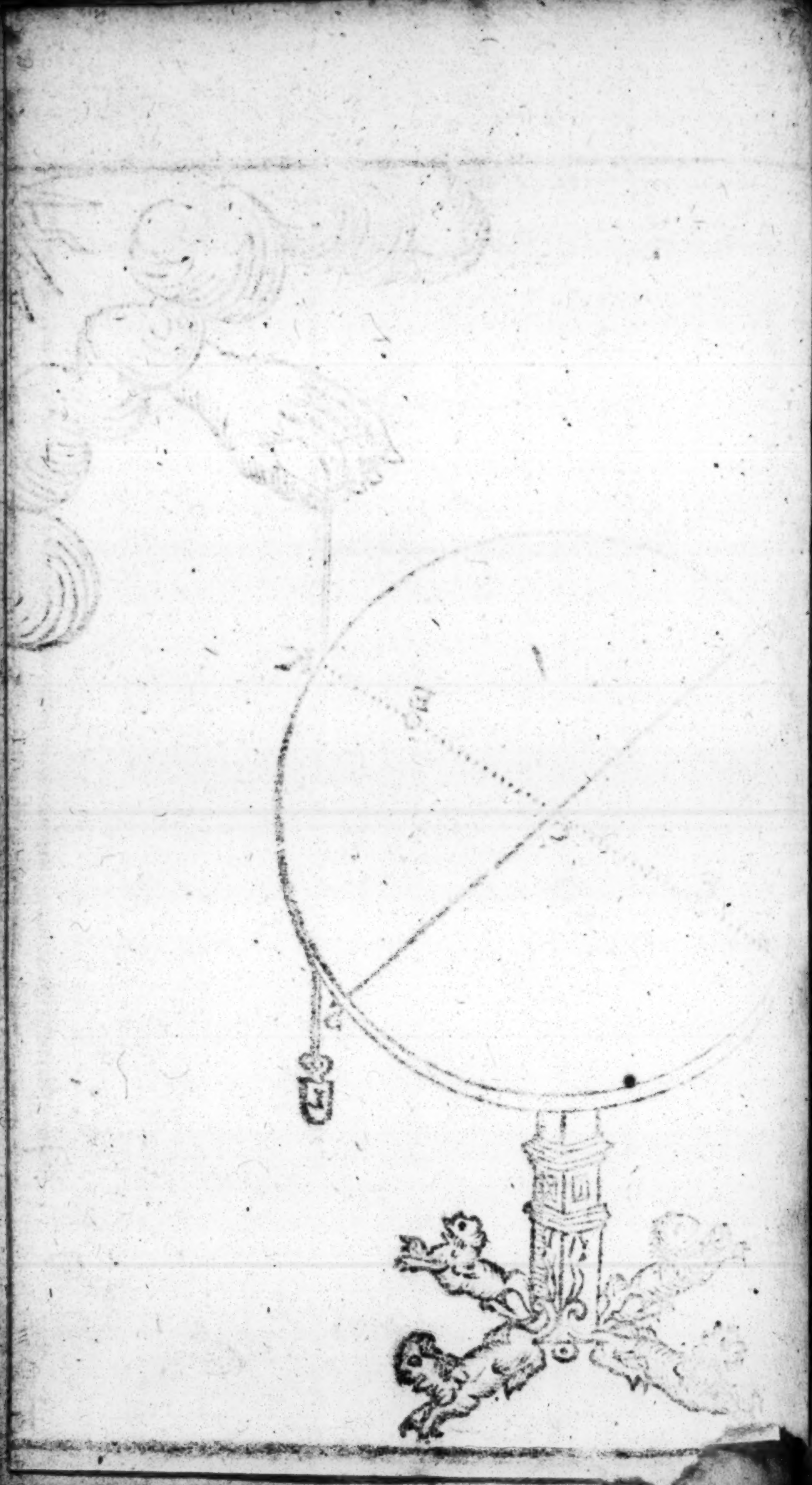
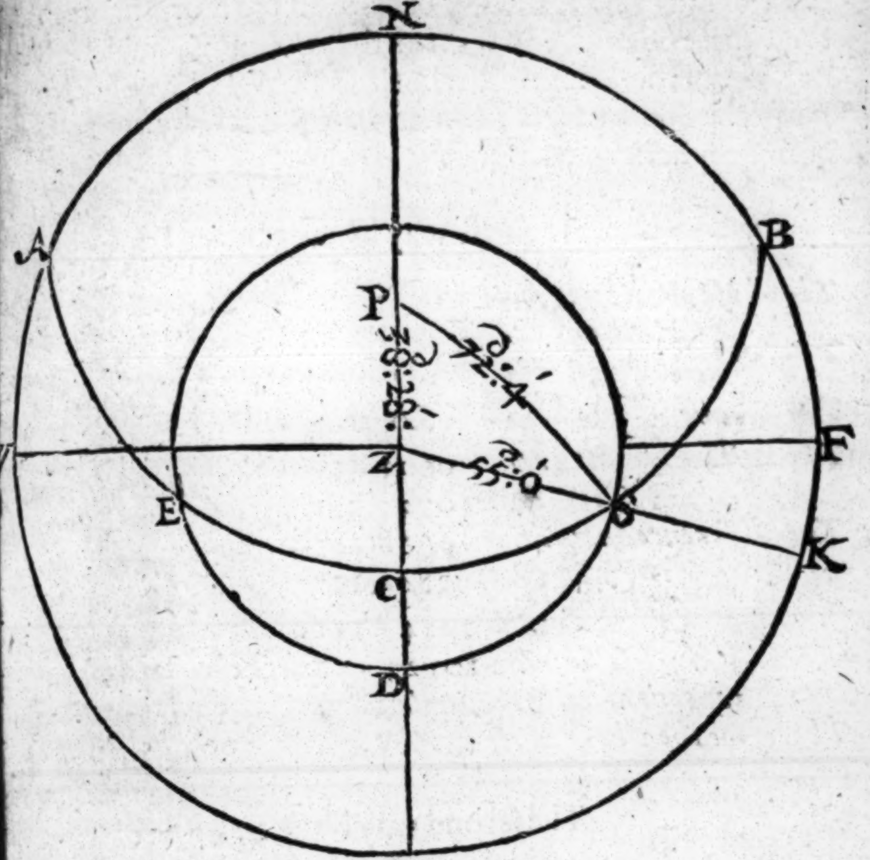




eigth of the Sunne in the morning on the East side of the meridian 35 d. you must therefore resolve the oblique triangle Z S in the schem adjoyning, consisting of these three great circles of the sphere, *vizt.* Z P part of the meridian of the place, P S part of a great circle limiting the declination of the Sunne in the paralell of A C B, and Z S part of the azimuth giving the heighth of the Sunne in the almicanter E D S, wherein S P the complement of the elevation is given 38 d. 28′, and Z S the complement of the Suns heighth is found by instrument 55 d. and P S the complement of the declination may bee had out of Mr. *Wrights* booke of Navigation, or the like, or may bee calculated having the place of the Sunne by the first of the first case of *R. S.* triangles, and is in this instance supposed to be on the

the 1 of May 1622, about 8 of clock in the morning 72 d. 4', these three sides given, we seek the angle at Z, which gives distance of the Sunne in the horizon N W H F, either from North or South part of the meridian N Z H, by the first case oblique sphericall triangles.

The first way by tangents.

The base	*P S*	72d. 4'		
The sides	*Z S*	55 0		
	Z P	38 28		
The summe		165 32	Logar.	
The halfe		82 46	0003.4701	*Arith. compl.*
The difference		10 42	0731.2662	
		27 46	9668.2665	
		44 18	9844.1137	
	Totall		20247.1165	
	The halfe		10123.5582	*Is the Logarith.*
tangent of halfe the angle				53 d. 2' 30"
Therefore the whole angle K Z N				106 5 0

The second way by sines.

The base	*P S*	72d. 4'	Logar.	
The sides	*Z S*	55 0	0086.6355	*Arith. compl.*
	Z P	38 28	0206.1683	
The summe		165 32		
The halfe		82 46	9996.5298	
The base subduct		10 42	9268.7338	
Radius & seventh propor.			19558.0674	
The halfe thereof			9779.0337	*Is the Log.*
sine of halfe the angle			36d. 57' 30"	
Therefore the whole angle K Z H			73 55 0	

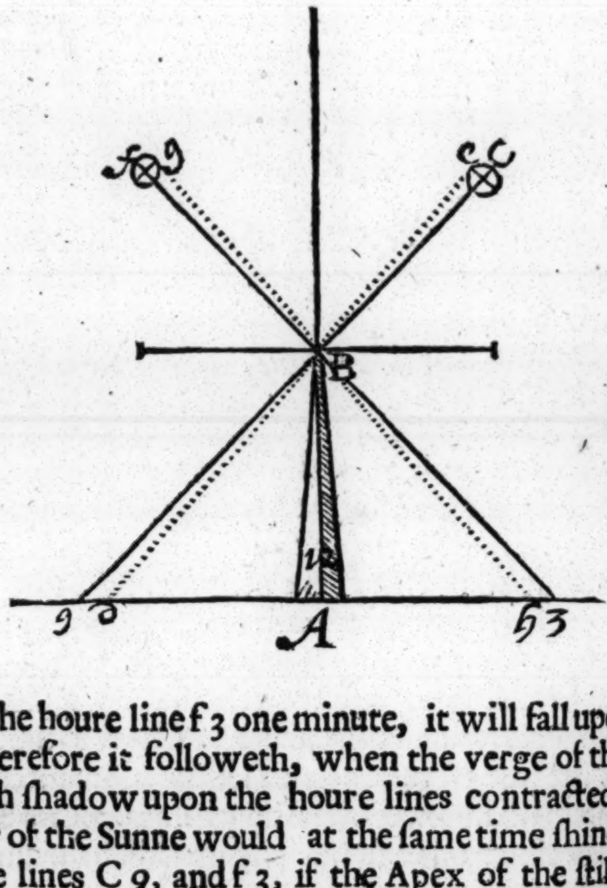
But you must remember that the first operation giveth the angle Z, reckoned from the North, as it naturally lieth in the Sphere, the second giveth the angle reckoned from the South

which is the complement of the former, and in this case is more fit for our purpose. Take therefore off a chord fitted to the Radius C N 73 d. 56, and set it from the line of shadow Southwards to S, or 106 d. 4′, and set it from the line of shadow Northward to N, and by these two points draw a line thorow the center C, and N C S shall be a true meridian line, whereupon you must place the 12 of clock houre line of your Dyall.

But it may be objected, that notwithstanding all this paines, neither this, nor any other Diall, shewes the time exactly true, without correction, and allowance for the semidiameters of the Sunne, which is generally omitted by all Authours. I grant, that in a strict acception this is true, but seeing that sense must be our judge, and Scale and Compasse our instruments, such curiosity might be safely neglected, yet the rules of Art remaine unblamable.

To answer this objection, it cannot be denied, that the true houre line of every Diall is the shadow of the axis, cast by the center of the Sunne upon the opposite part of the meridian, intercepted by the plane, but because the shadow of the center is hindred by the stile, the shadow of our houre lines proceedeth from the limb, which alwayes precedeth the center one minute of time, answerable to 15′ the semidiameters of the Sunne. To allow this in the heighth of the stile, is erroneous, because every stile representing the axis, ought to be paralell thereto; but if wee abate for the horizontall at *London* 15′, the semidiameters of the Sunne, out of 15 d. 32′, the heighth of the stile, and make the stile to 51 d. 17′, or for a South Diall, to 38 d 13′, wee shall cause the stile to point so many minutes under each pole, which puts it out of paralellisme with the axis, and consequently makes it give a false shadow upon the plane. Let the stile therefore bee kept to the true elevation, and let the allowance bee made in the equinoctiall distances of the houre lines, contracting them one minute of time, on each side the meridian, or substile respectively: in regard that the shadow of the verge doth always precede the shadow of the center so much. So shall it come to passe, that when the limb of the Sunne doth give shadow to the houre line upon the plane, one minute sooner or later then it should do, the center of the Sun shall at the same time be just upon

on the meridian, repreſented by the ſame as in this diagra
doth appeare. Wherein ſuppoſe A B to bee the length of
perpendicular ſtile, in the forenoone the true houre line dr
from the center of the Sunne is C 9, which the verge of
Sun ſheweth at e d, one minute of time ſooner than it ſhe
contract the houre line C 9 one minute, it will fall upon
prickt line e d; againe in the afternoone, the true houre
drawn from the center of the Sunne is f 3, which the ver
the Sun ſheweth at g h, one minute of time later than it ſho



contract the houre line f 3 one minute, it will fall upon the
g h; wherefore it followeth, when the verge of the Sun
or g giveth ſhadow upon the houre lines contracted e d &
the center of the Sunne would at the ſame time ſhine upon
true houre lines C 9, and f 3, if the Apex of the ſtile at B
not hinder the ſame. In imitation of this example for the h
zontall, the true houre lines (according to this ſtrict accep
by abating fifteen minutes in each houres equinoctiall diſta
anſwering to one minute of time) may bee caſt up for all o
kinde of Dials whatſoever.

Ho

Houres		Equi.dist.		Log.tangents	True ho. dist.		
		d	'		d	'	''
12	0						
11	1	14	45	9314.1598	11	38	51
10	2	29	45	9650.7972	24	6	31
9	3	44	45	9889.9552	37	49	2
8	4	59	45	10127.9405	53	19	12
7	5	74	45	10458.1694	70	48	6
6	6	89	45	12253.9250	89	40	51

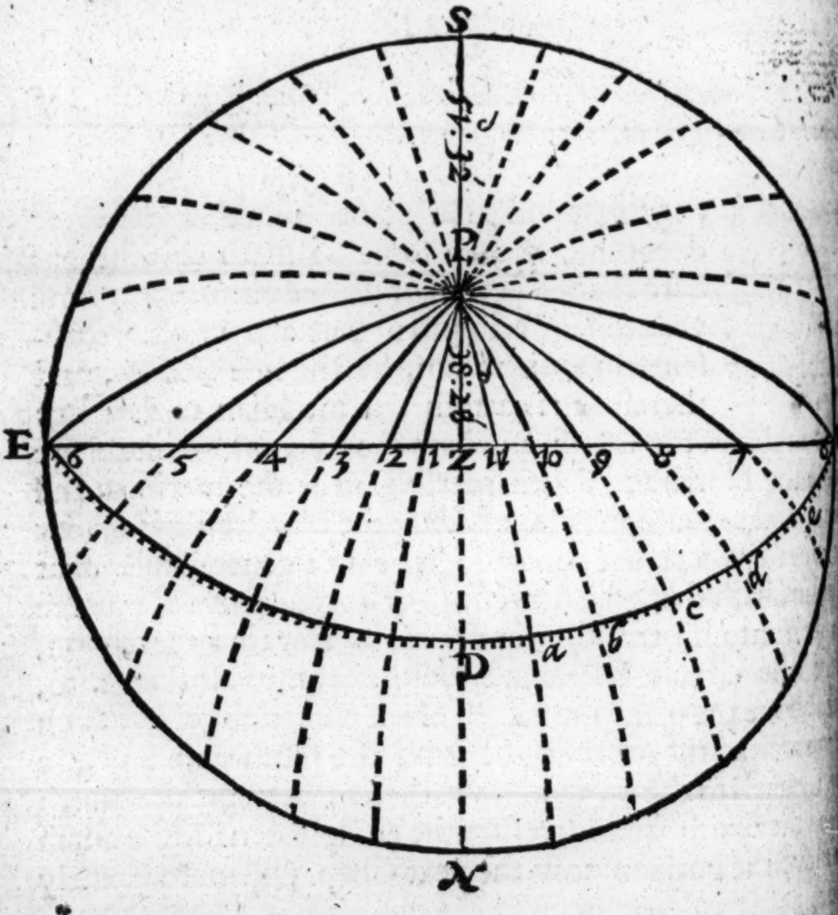
CHAP. VII.

To draw the houre lines upon a direct South plane, the heighth of the pole being given.

EVery perpendicular plane, whether direct or declining, lieth in ſome azimuth or other, as here the South wall or plane doth in the prime verticall, or azimuth of Eaſt and Weſt, repreſented in this ſchem, by the line E Z W, and therefore it cutteth the meridian of the place at right angles in the zenith, and hath the two poles of the plane ſeated in the North and South interſection of the meridian and horizon, and becauſe the plane hideth the North pole from our ſight, we may therefore conclude (it being a generall rule, that every plane hath that pole depreſſed, or rayſed above it, which lyeth open unto it) that the ſouth pole is elevated thereupon, and the ſtile of this Diall muſt looke downwards thereunto, erected above the plane the heigth of the antartick pole, which being an arch of the meridian betwixt the ſouth pole and the nadir, is equall to the oppoſite part thereof betwixt the north pole and the zenith, and therefore the complement of the north pole above the horizon, as in the next Chap. will more plainely appeare.

The Demonstration.

Suppose then that P in the schem, drawn by the rules of fourth Chapter, be now the south Pole, and S the south part the meridian, N the north part &c. then do all the houre cir from the pole cut the line E Z W, representing the plane u qually, as the houre lines will do upon the plane it selfe, an by the figures in the schem set unto every houre line the doth appeare. Now having already the elevation of the p given, as was in the horizontall, there is nothing else to done, but to calculate the true houre distances upon the E Z W, from the meridian S Z N, and then to proceed as



erly, and note, because the houres equidistant on both sides e meridian, are equall upon the plane, the one halfe being und, the other is also had, therefore you may begin with hich side you will.

In the triangle Z P 11, right angled at Z, I have Z P given d.28′, the complement of the heighth of the pole, which is heighth of the stile to this Diall, and the angle at P 15 d. one ures distance from the meridian upon the equator, to finde side Z 11; or if you will draw the equinoctiall circle DW, it will bee more proper in the quadrantall triangle D*a*, wherein the quadrant P D is given 90 d, the side D *a* is ven 15 d. of the equinoctiall, the measure of the angle P, and e side PZ is given, 38 d. 28′, to finde the side Z 11, as before by e variety of the fift case of R.S. triangles. For,

The Arithmeticall calculation.

As the sine of P D	90^d. 0′	10000.00	
is to the tangent of D A	15 0	9428.05	
so is the sine of P Z	38 28	9793.83	
To the tangent of Z 11	9 28	19221.88	

which 9 d. 28′ is the true distance of the houres of 1 and 11 from the meridian upon the plane.

And because there is no other variety in calculating the rest f the houres, but only changing the angles at P, which encrease 5 d. for every houres distance from the meridian, therefore as ou did in the horizontall, first make a table like the example djoyning, wherein set down all the houres and halfe houres om the meridian, with the equinoctiall distances by them, of d. 30′ for halfe houre after 12, 15 d. for 1 and 11, 22 d. 30′ r halfe houre after 1, &c. then transcribe the Logarithmicall ne of 38 d. 28′. 9793.83. (which in this Diall is the heighth f the stile above the plane) into a peece of paper, and adde it nto the severall Logar. tangents of the equinoctiall distances f the houres and halfe houres, so shall you produce other Log. ngents, which set down in the table, and sought in the Caon, will give you the true houre arches to bee set off from the oint E of the meridian line in the Diall, each way upon the circle E o 6, representing the plane, as in the table annexed appeareth.

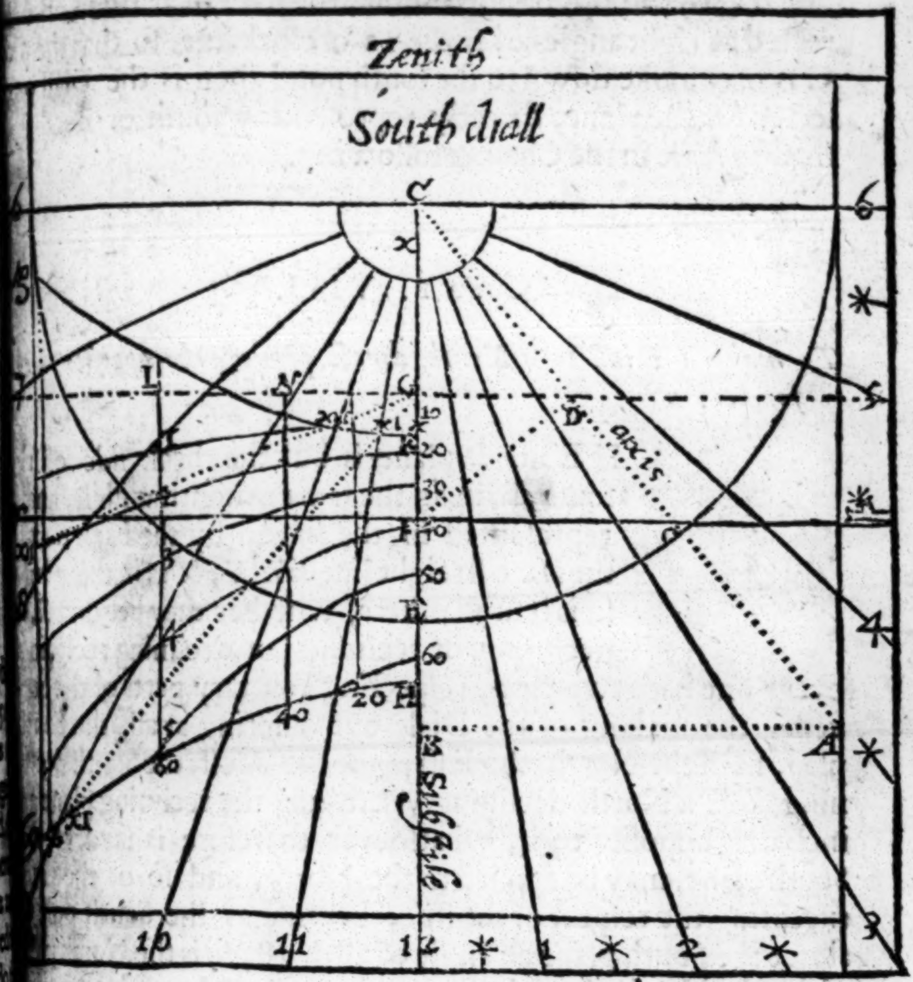
H Houres

Houres & Halves.		Equinoct. distance.	Logarith. of tangents.	True houre distance upon the plane.	
12	0	d '		d '	Differ.
.	½	7.30	8913.26	4.41	
11	1	15. 0	9221.88	9.28	4.47
.	1½	22.30	9411.05	14.27	4.59
10	2	30. 0	9555.26	19.45	5.18
.	2½	37.30	9678.81	25.31	5.46
9	3	45. 0	9793.83	31.53	6.22
.	3½	52.30	9908.84	39. 2	7. 9
8	4	60. 0	10032.39	47. 8	8. 6
.	4½	67.30	10176.60	56.20	9.12
7	5	75. 0	10365.77	66.42	10.22
.	5½	82.30	10674.40	78. 3	11.21
6	0	90. 0	10000. 00	90. 0	11.57
The heigth of the stile 38 d. 28'.					

Where the Log. tangent of 1 & 11 produced by addin[g]
Logar. sine of 38 d. 28' unto the Logarith. tangent of 1[5]
is 9221.88 (the Radius being cut off, as in the cautio[n]
foresayd) the arch whereof is 9 d. 28'. So is the Log. tan[g]
of 5 & 7 produced by the like addition of the Log. sine of 3[8]
unto the Logar. tangent of 75 d. 10365.77 the arch wh[ereof]
is 66 d. 42', the like may bee sayd of the rest of the houres a[s]
10, 3 and 9, &c. but because I have so particularly delivere[d]
the operations in the horizontall, I may here forbeare to d[o the]
like, and referre you to the table.

The Geometricall projection.

In the making of the Diall, first draw the perpendicula[r]
C E B, which is the 12 of clock houre, crosse it at right [angles]
with 6 C 6, which is the 6 of clock houre, then take 60 d. o[f the]
chord, equall to Z S the Radius of the schem, and making C
center, draw the circle 6 E 6, representing the azimu[th]
which the plane lieth, which done, take off the chord



houre diſtances, *vizt.* 9 d. 28′ for 1 and 11, 19 d. 45′ for 2 and 10, 31 d. 53′ for 3 and 9, and ſo of the reſt, and ſet them from E (the interſection of the meridian and plane) both wayes upon the circle 6 E 6; ſtreight lines drawn from the center C to thoſe pricks in the circle, are the true houre lines deſired.

Having drawn all the houre lines, take 38 d. 28′ (the elevation of the pole or ſtile above this plane) off the ſame chord, and ſet it from E to o, draw the prickt line C o A, repreſenting the axis, or heighth of the ſtile, from any part of the meridian, draw a paralell line to 6 C 6, as is B A, and it ſhall make a triangle the fitteſt forme to ſupport the ſtile at the true heighth; let the

 line

line 6 C 6, and B A be horizontall, the triangular ſtile C B A rected at right angles over the 12 of clock line, ſo that the C A may looke down to the ſouth pole, then is the Diall fected for the plane, directly repreſenting ſouth or north, shall appeare in the Chapter following.

CHAP. VIII.

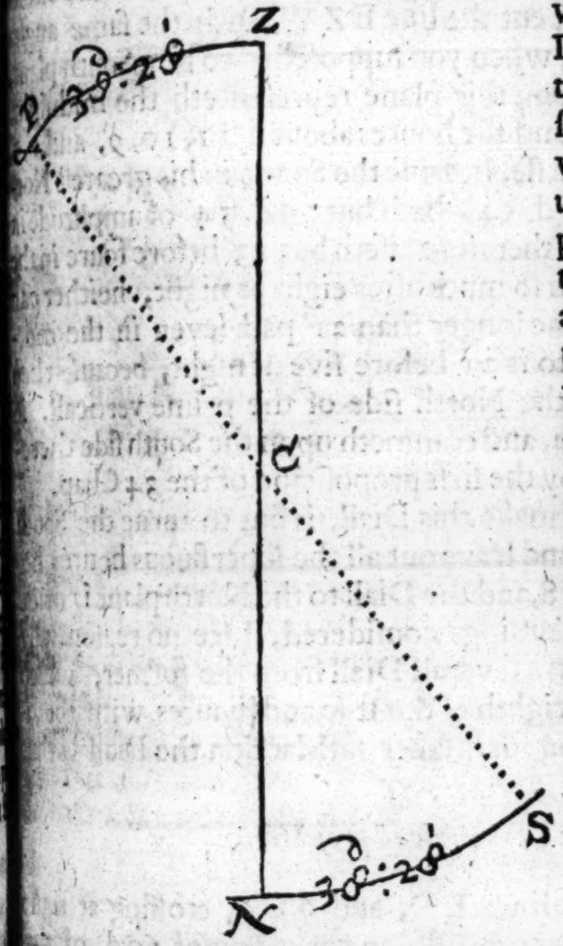
To make a Diall to a North direct plane, the oppoſite to former.

THE north plane is but the back ſide of ſouth, lying in the ſame azimuth with it, a repreſented in the ſchem by the back pa the ſame ſtreight line E Z W, & as in this pl ſo is it in all others, whether they bee direct declining, or reclining, or declining recli every one hath two faces, reſpecting contrary parts of the he vens, the making of the Dials not differing at all, the So plane hath the North, the Eaſt plane the Weſt, the South de ning Eaſt a North declining Weſt, and the reclining pla inclining oppoſite to it, whatſoever therefore is ſayd of South plane, may be applied to the North, and ſo of the excepting the reſpect of the ſtile, becauſe as the South po above the South plane an angle of 38 d. 28′, ſo is the North under the North plane the like, and equall angle, and each muſt reſpect his owne pole.

The Demonſtration.

To make this plane, conſider the diagram adjoyning, w in Z C N repreſenteth a South and North wall erect dire the zenith, N the nadir, and C the center of the world, the axis, Z P and N S two arches of the meridian, there North pole, diſtant from Z the zenith, and depreſſed und North ſide of this plane the angle of P C Z, 38 d. 28, much is the South pole S diſtant from the nadir N, and

bove the South side of this plane, the angle of N C S 38 d. 28′, equall to the former, as may be easily proved, because the angles Z and N are right angles, and P and S subtented by like sides are equall by the work, and the angles at C are verticall, N C S is therefore the heighth of the stile for the South wall, which must looke downwards to the South Pole S, & Z C P is the heighth of the stile for the North wal, which must look upwards to the north pole P. And because there may bee hereafter no doubt, how to place the stile, which giveth the shadow to the houres in every Diall, observe this generall Rule. The side of the stile representing the axis must alwayes respect one of the poles, *videlicet*, in all erect planes, whether direct, or declining upon the North side, the North pole; upon the South side, the South pole, as in P Z N, the pole P,



but in S N Z, the pole S; in all East and West reclining, the North pole, in inclining East and West, the South pole; in all North reclining planes, whether direct or declining, the North pole; and in the inclining planes, opposite to them, the South pole; lastly, in all South reclining planes, whether direct or declining, if the plane passe between the zenith and the pole, the

axis of the stile must respect the South pole, and on the inclin
side, the North pole; but if the plane passe between the hori
and the pole, the contrary.

Suppose therefore againe in the first schem of the for
Chapter, P to bee the North pole, and the side E Z W obje
to it, to be the North wall or plane, then do all the houre cir
drawn from the pole cut the line E Z W with the same an
that they did before, when you supposed it to be a South pl
only the meridian upon this plane representeth the midni
and not the noone, and the houres about it 11, 10, 9, and
3, are altogether uselesse, because the Sunne in his greatest N
thern declination 39 d. 54', hath but 39 d. 54' of amplitude
this our latitude, and therefore riseth but 13' before foure in
morning, and setteth so much after eight at night, neither
it shine upon this plane longer than 21' past seven in the m
ning, and returning to it 21' before five at night, because
the Sunne passeth on the North side of the prime vertical,
which this plane lieth, and commeth upon the South side the
of, as doth appeare by the first proposition of the 34 Chap.

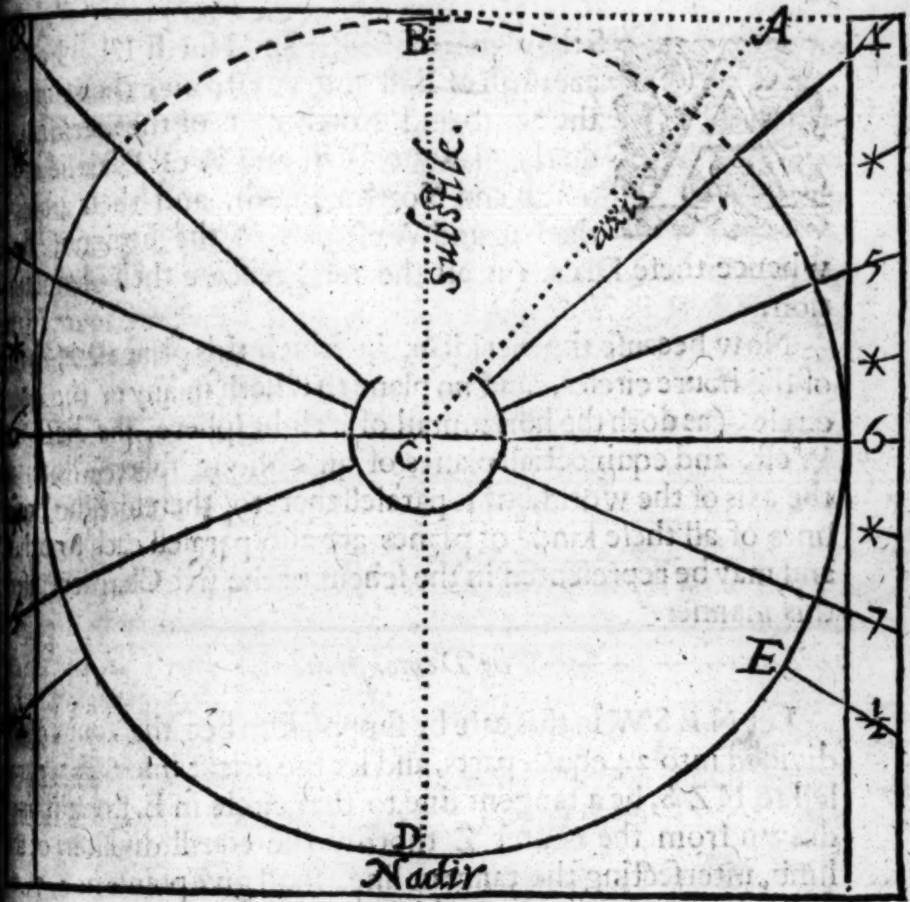
Now therefore to make this Diall, is but to turne the So
Diall upside down, and leave out all the superfluous houres
tween 5 and 7, 4 and 8, and the Diall to the North plane is m
to your hand. These things considered, I see no reason w
this should be reputed a severall Diall from the former, w
agreeth both in the heighth of the stile and houres with th
ther, notwithstanding for further satisfaction the Diall is
easily made.

The Geometricall projection.

Draw two streight lines B D, and 6 C 6, crossing at ri
angles in C, open your compasses to the extent of 60 d. of
chord, and upon the center C make the circle E B D, repre
ting the azimuth wherein the plane lieth: but of the forme
ble calculated for the South Diall, take the houre distance
and 8, which is 47 d. 8', and of 5 and 7, which is 66 d. 42',
set them from the point B of the meridian line B C, upon
circle E B D, both wayes, so shall you have pricks, unto w
from C draw streight lines for the houres desired, contin

Heighth of the ſtile P Z 38 d. 28′.

Zenith.



North Diall.

houre lines of 5 and 7 beyond the center alſo, ſo have you as many as need. The ſtile is the triangle A B C making an angle of 38 d. 28′ the very ſame that was for the South Diall, and is repreſented by the prickt lines, wherein the ſide C B is the ſubſtile or line of midnight, A B muſt ſtand horizontally, the center C downwards, that the line C A repreſenting the axis may point upwards to the North pole, and the whole ſtile C B A ſtand perpendicular to the line C B, ſo have you done what was deſired.

CHAP. IX.

To draw the houre lines upon a direct East or West plane.

AS the planes of South and North Dials lie in azimuth of Eaſt and Weſt, and their poles the South and North parts of the meridian, do the planes of Eaſt and Weſt Dials lie in South and North azimuth, and their poles the Eaſt and Weſt part of the horizon, from whence theſe Dials, (as all the reſt) receive their denomination.

Now becauſe the meridian, in which this plane lieth, is of the houre circles, and no plane that lieth in any of the houre circles (as doth the horizontall of a right ſphere, the East and Weſt, and equinoctiall planes of an oblique ſphere) doth the axis of the world, but is paralell thereto, therefore the houre lines of all theſe kinde of planes are alſo paralell each to other, and may be repreſented in the ſchem of the ſixt Chapter, after this manner.

The Demonſtration.

Let N E S W in this caſe be ſuppoſed to bee the equinoctiall divided into 24 equall parts, and let the prickt line 8 E 2, paralell to N Z S, be a tangent line to that circle in E, ſtreight lines drawn from the center Z thorow the equall diviſions of the limb, interſecting the tangent line, ſhall give points in 4, 5, 7, 8, 9, 10, 11, thorow which paralels being drawn to the prime verticall, or 6 of clock houre line E Z W, you have the houre lines deſired, which may for more certainties ſake be found by tangents alſo; for making Z E of the former ſchem the Radius, and 8 E 2, continuing the tangent line as aforeſaid, let the ſector be opened to the width of Z E, (or for want thereof uſe the ſcale A 10, B 10, of the firſt Chapter) then ſhall the naturall tangent of 15 d. 268, and of 30 d. 577, and of 45 d. 1000 (equall to the Radius &c.) taken thereof, and ſet both wayes from E upon the tangent line 8 E 2, give the diſtance of the houre

ores of 5 and 7, 4 and 8, 3 and 9 &c. from the 6 of clock ure, as aforesayd.

The Arithmeticall operation.

Make therefore the table for the houre distances, as in the mple adjoyning. First set down the houres and parts, begin- with 4 and 8 the extream houres of the East and West Dials, and 7, 6 and 6, and so proceeding to 12, unto these houres d parts set the equinoctiall distances from 6 of clock each ay, (which being perpendicular to the plane, is here instead f the substile line) *vizt.* for 4 and 8, 30 d, for 5 and 7, 15 d, or 7 and 5 againe 15 d, for 9 and 3, 45 d, and so of the rest, nto these distances adjoyn the naturall tangents, *vizt.* of 15 d. 68, of 30 d. 577, of 45 d. 1000, &c. as you see in the example, o is the table fitted for use, and is generall for all latitudes whatsoever.

Houres and Halves.		Equino-ctiall di-stances.	Naturall tangents or houre dist. upon the plane	Houres and Halves.		Equino-ctiall di-stances.	Naturall tangents & houre dist. upon the plane
4	8	30d.0′	577	8	4	30d.0	577
	½	22.30	414		½	37.30	767
5	7	15.0	268	9	3	45.0	1000
	½	7.30	132		½	52.30	1303
6	6	Subst.	*	10	2	60.0	1732
	½	7.30	132		½	67.30	2414
7	5	15.0	268	11	1	75.0	3732
	½	22.30	414		½	82.30	7596
				12		Infinite.	

The Geometricall projection.

Proceed then to make the Diall, and first draw the horizontall line B A C, at your pleasure, upon any part thereof, as at A make two obscure arches, D B G, and F C E, the extent of 60 d. of the chord, of the same chord take 38 d. 28′, the heighth of the equator,

equator, which set from B to D, & from C to E, also take of 51 d. 32′, the heighth of the pole, and set it from B to G from C to F, draw the streight lines D A E representing quinoctiall, as by the angle B A D 38 d. 28′, which the ho and equator make, and F A G representing the axis world, as by the angle F A C 51 d. 32′, which the pole an rizon make, is manifest, & this will be also the 6 of clock or substile of this Diall, seeing the plane it selfe lieth in the ridian 90 d. distant from the same; now because the ap top of the stile A L (equall to the distance of the houres 9 from 6) doth give the shadow in all planes that are para the axis, it will be necessary to proportion the stile to the that the houre lines may be enlarged or contracted accord the length of the same, which is done in this manner; Le place of the stile at A, and the place of the extream houre or K (in the East Diall 11, in the West 1 of clock) 75 d. upon the equator from A be given in some known parts, will be more or lesse according to the greatnesse of the suppose $3\frac{48}{}$, that is 3 inches and 48 hundred parts, *by this case of R. P. triangles.*

		Logar.
As the sine of A L ♈	75^d. 0′	+ 0015.0562 *Arith.*
Is to the line A ♈	$3\frac{48}{}$	+ 0541.5792
So is the sine of A ♈ L	15^d. 0′	+ 9412.9962
To the line A L	$0\frac{93}{}$	— 9969.6316
		Compl. 0.

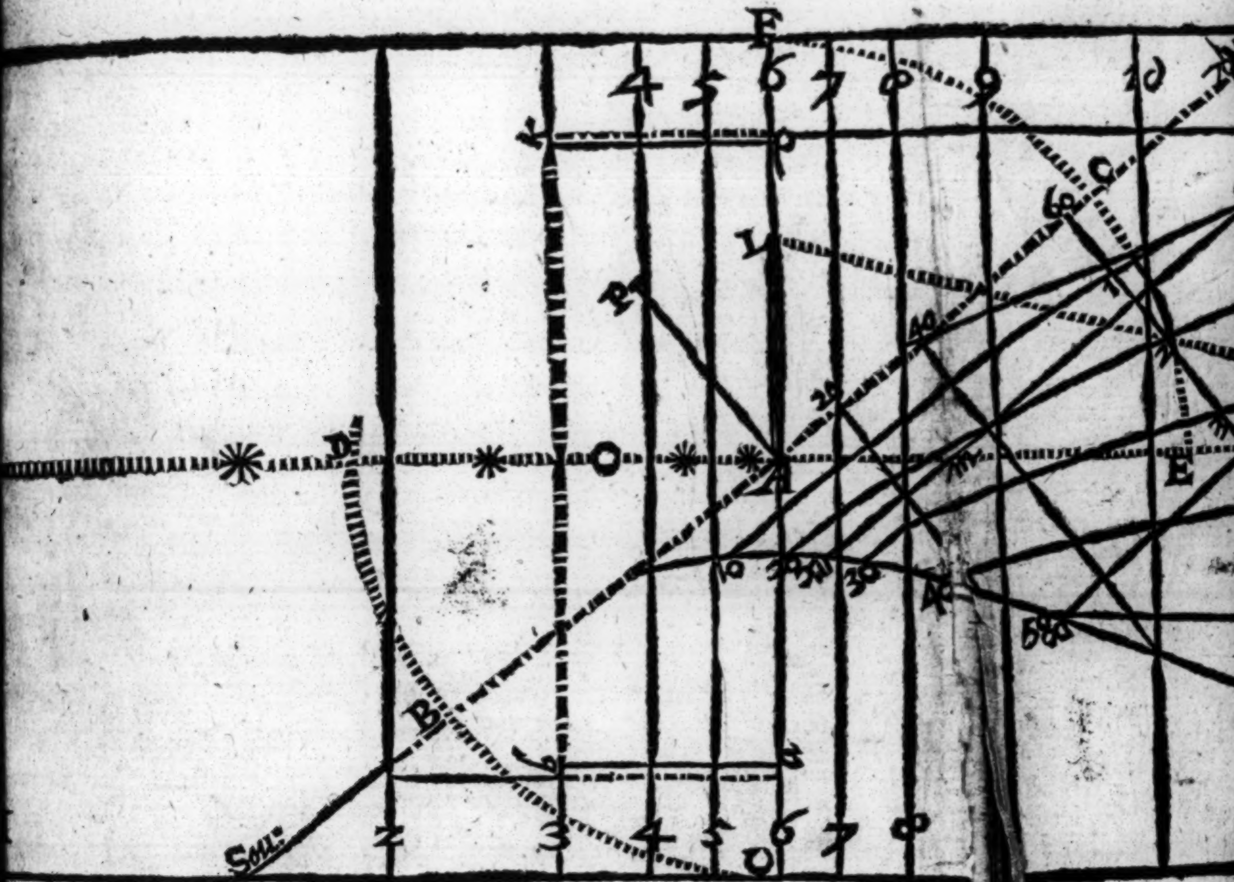
Or by the Chiliads alone for want of a canon.

As the naturall sine of	75^d. 96593	+ 5015.0544
Is to the line A ♈	$3\frac{48}{}$	+ 0541.5793
So is the naturall sine of	15^d. 25882	+ 4412.9978
To the line A L	$0\frac{39}{}$	— 9969.6315
		Compl. 0.

Or by the same case you may also say,

As the Radius ♈ A
Is to A L the tangent of 15 d.
So is the line ♈ A
To the line A L in the same parts.

The East Diall.



The West Diall.

Place this folio 98.

[...]at is 4 times the Radius and here 31 hundred parts, by this [...]mme divide the Radius 1000000, encreased with as many ci-

phers

o D, & from C to E, alſo take t
the pole, and ſet it from B to G,
ght lines D A E repreſenting t
B A D 38 d. 28′, which the hor
A G repreſenting the axis of
C 51 d. 32′, which the pole and
his will be alſo the *6* of clock h
ng the plane it ſelfe lieth in the
ſame ; now becauſe the ape
o the diſtance of the houres o
ow in all planes that are parall
o proportion the ſtile to the pl
nlarged or contracted accordin
n is done in this manner ; Le
place of the extream houre
the Weſt 1 of clock) 75 d. d
given in ſome known parts, w
g to the greatneſſe of the p
nd 48 hundred parts, *by this*

Logar.

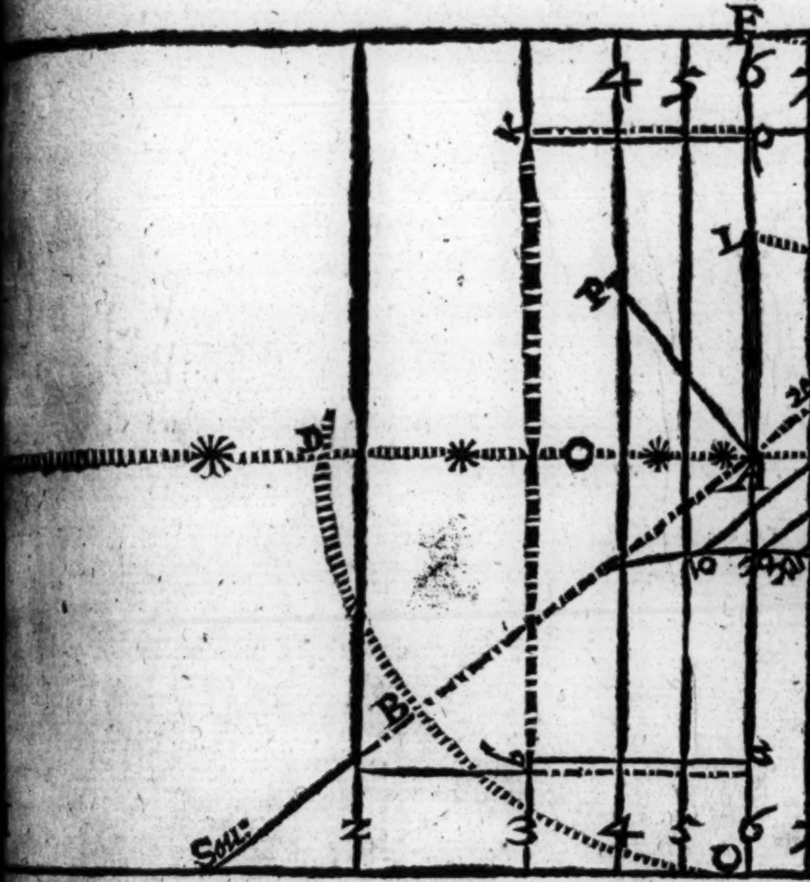
. 0′ + 0015.0562 *Arith.*
+ 0541.5792
. 0′ + 9412.9962
— 9969.6316
Compl. 0.

ne for want of a canon.

96593 + 5015.0544
348 + 0541.5793
25882 + 4412.9978
019 — 9969.6315
Compl. 0.

ſe you may alſo ſay,

The Eaſt Di

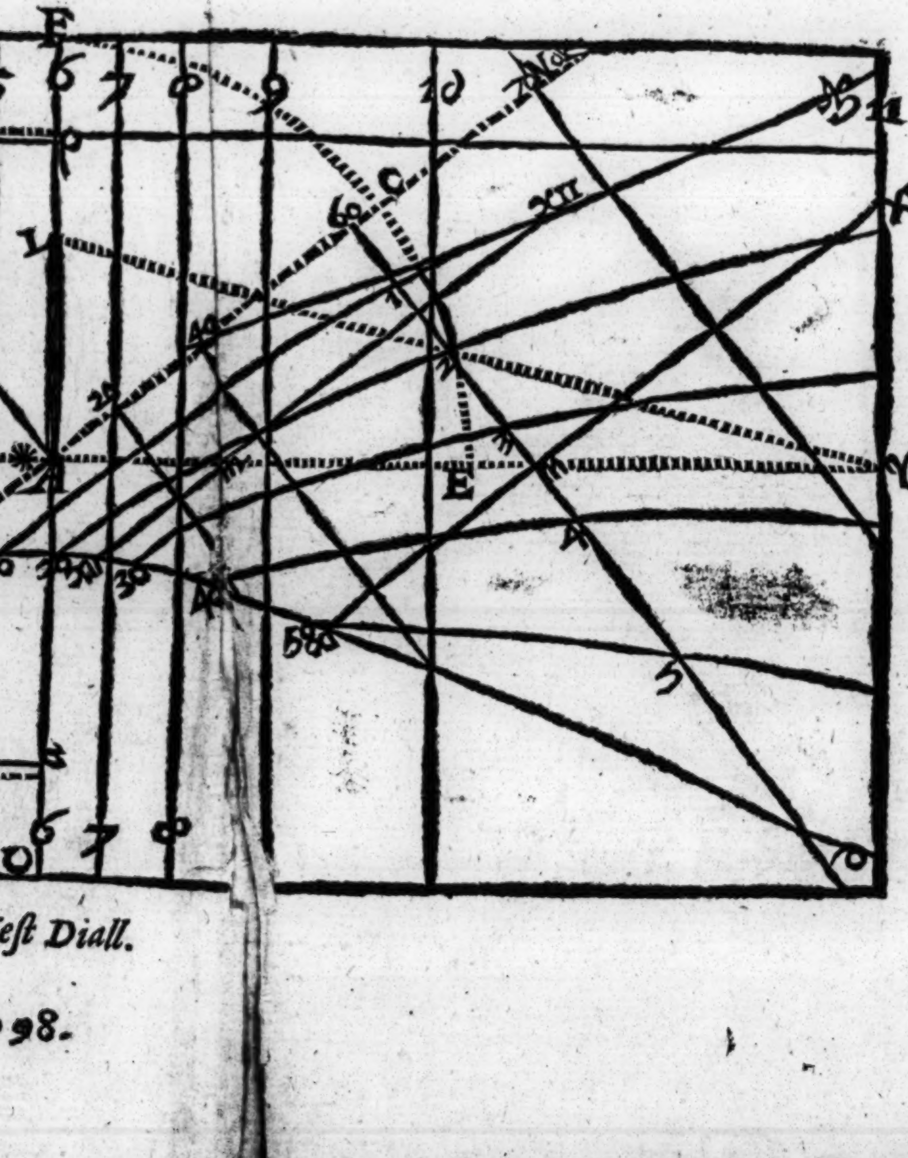


The Weſt Dia

Place this folio 98.

e 24 times the Radius and here 31 hundred parts, by th
ame divide the Radius 10r0000, encreaſed with as many c
phe

e East Diall.



est Diall.

98.

by this
many ci-
phers

To the line A L in the same parts.

the length of the stile A L proportionall to the plane being found by the Chiliads alone, (as in like cases may be done) by the Canon and Chiliads together, to be 0 93 centesimes of an inch, make that the Radius, then shall the equator K A ♈ a tangent line thereunto, and the distance of the houre lines 5 and 7 each way from A upon that line shall be the naturall tangent of 15 d, which is 268 parts, the distance of 8 and 4 the naturall tangent of 30 d. 577 parts, the distance of 9 and 3 (equall to the Radius) the naturall tangent of 45 d. 1 000 parts, the distance of 10 and 2 the naturall tangent of 60 d. 1 732, and the distance of 11 and 1 the naturall tangent of 75 d. 3 732, as in the table doth appeare: Wherefore open the sector to the length of AL, or divide a line equall thereto (as in the first Chapter) from either of which take off these distances, which set both wayes from A will afford you points in the equator ♈AK, thorow which streight lines being drawn paralell to the 6 of clock houre, you have at one work made both the East & West Dials, as in the tipe appeareth, only remember that because the Sun riseth before 4 in ♋, and setteth after 8, you must adde two houres before 6 in the East Diall, and two houres after 6 in the West Diall, that the plane may containe as many houres as it is capable of.

Againe, for varietity sake, or haply you have not a line divided into 100 parts of an inch, you may without resolving a triangle, or giving the length of the plane in known parts, finde the length of the stile proportionall thereto, which being made the Radius, shall justly fill the plane with any two extream houres assigned whatsoever. For,

As the naturall tangents of the two extream houres added together,

Are to the length of the plane in unknown parts,

So is the Radius,

To the length of the stile in known parts.

Therefore adde the naturall tangent of 4 of clock 577, and the naturall tangent of 11 clock 3 712 together, the length of the whole line 4 ♈, or 8 K, the two extream houres, will bee 4 309 that is 4 times the Radius and nere 31 hundred parts, by this summe divide the Radius 1 00 0000, encreased with as many ciphers

phers as you think good, the quotient will be 232 the len
the ſtile A L, as in the example appeareth,

```
   4309
   ----
1000000 (232
 8618
 -----
 13820
 12927
 -----
   8930
   8618
   ----
    312
```

Yet alſo by Logar. this work is facilitated, for if you ta
Arith. complement of the Logar. of 4309 (neglecting the
racterisk) which is 0365 . 6235. and ſeeke that in the
liads with the characteriſk of 2, 3, or 4, you ſhall finde 23
number anſwerable to your deſire. Wherefore open the
to the length of 4 ♈, ſuppoſed to bee the capacity of the
(or divide a line equall thereto, as in the firſt Chapter) and
thereof 232 parts for the length of the ſtile A L, make tha
Radius, and the naturall tangents of the houre diſtances i
table ſhall juſtly fill the plane.

The houre lines being thus drawn, the ſtile may bee e
a ſtreight pin like A L, fixed in the center A at right angl
the plane, ſhewing the houres with the top thereof, or el
oblong like unto a b c d, of equall heighth to A L, erected p
pendicularly over the houre line 6 A 6, and ſhewing the ho
with the upper edge thereof; let B A C bee horizontall, B
ſpecting the South, and C the North, then will ♈ A K poi
to the equinoctiall, and 6 A 6 to the pole, and the Diall ſtan
its due poſition, to receive the ſhadow of either of the ſtile
foreſayd.

The Weſt Diall is the ſame in all reſpects with the Eaſt,
appeareth by the making of them, only the arch BD the heig
of the equator above the horizon muſt bee drawn on the ri
hand of the center A for the Weſt Diall, as here it was on

t hand for the East Diall, (and as the equinoctiall it selfe lieth om you in the heavens, your face being turned to the plane) at so the houre lines crossing it at right angles, may respect the les of the world, unto which they are paralell.

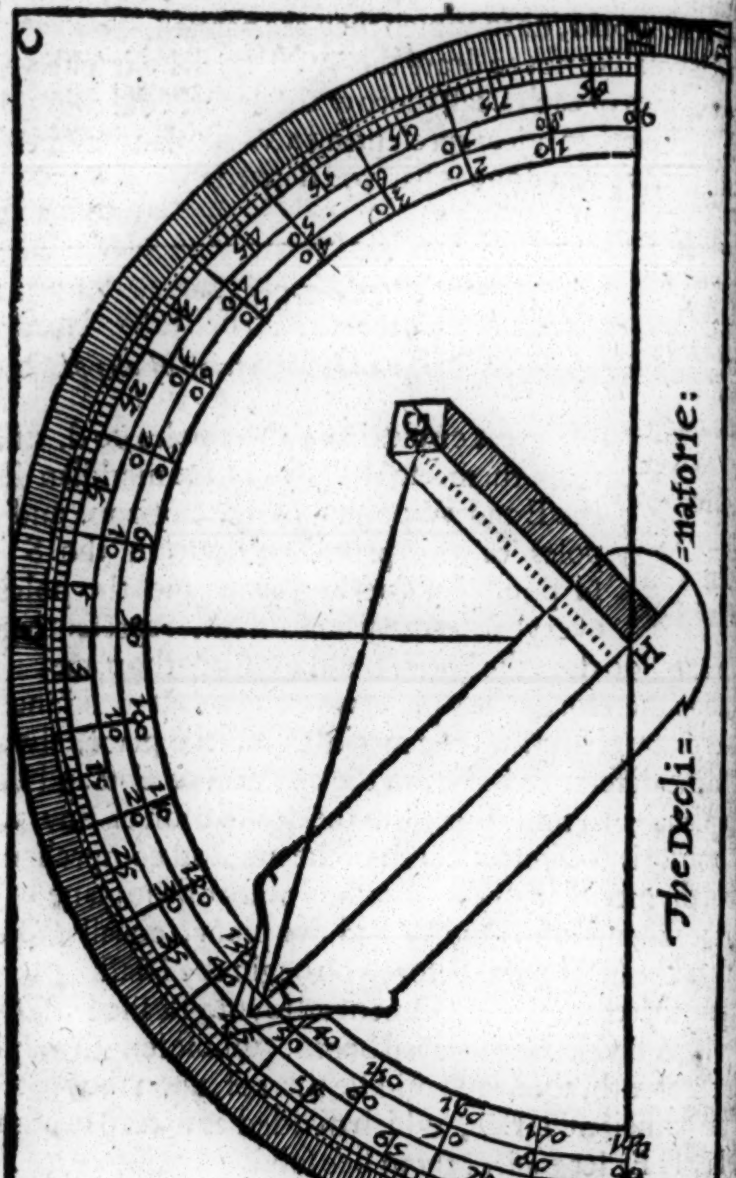
And if you like not to draw the West Diall by it selfe, prick e houre lines of each Diall thorow the paper, and draw them aine on the other side, representing a West plane, as this doth e East, so have you done what you desired.

CHAP. X. The first part.

How to finde the declination and reclination of any plane.

ALL great circles have their poles 90 d. distant from them, so the poles of the meridian lie in the E and W points of the horizon, and the poles of the prime verticall in the S and N points of the horizon, and the poles of every intermediat azimuth, representing so many planes, 90 d. in the horizon distant from the plane. The declination therefore of any plane is the horizontall distance of the poles of the plane from the meridian of the place, alwayes equall to the difference between the azimuth of East and West and the plane; to finde therefore the declination of any wall, flat or plane, is to finde the arch of the horizon comprehended between the meridian of the place and poles of the plane, or between the azimuth of E and W and the plane, equall thereto, which must be first found before you begin the Diall.

Prepare therefore the instrument adjoyning called a Declinatory, let A B C D be a squared board, whose length may bee double the bredth, about the middle thereof, upon the center H draw the semicircle L E K, which divided into two quadrants by the line H E, let each of them bee subdivided into 90 d. for the use of the Reclinations, accompting from the middle line E H both wayes; and into 180 d. for the use of declinations, accounting from the diameter L B. Let the moveable lable G F H turne upon the center H, and let the perpendicular H G be


The Decli=
=natorie:

erected at right angles to the line of the lable F H from the
p of the perpendicular G to the end of the lable at F make fast
ſmall thred, whoſe ſhadow upon the line F H G ſhall direct
e true poſition of the lable.

Vpon the backſide of the ſame draw another ſemicircle con-
ntrick with the former, which divided into two quadrants,
ch quadrant into 90 d. accounting the firſt degree from the
ameter A B, cloſe under the periphery ſo divided make a hol-
w groove (like the black circle) of ſuch capacity that a ſmall
llet hanging by a thred from the center, may play at liberty
erein, by application of the ſide D C unto any reclining, and
e ſide A B unto any inclining plane, the thred on the backſide
f the inſtrument doth interſect the degree of reclination and
clination, accounting from the diameter A B, without any
ore trouble, which being plaine and common in uſe, I leave
o practice without further directions, only remembring that
the board be large enough to receive concentrick circles with
iagonals, the work proceeding to parts is the more perfect.

But for want of ſuch an inſtrument, you may with great eaſe
y croſſing two rulers at right angles, the one paralell to the ho-
izontall line, the other to the verticall line of the plane, give
he reclination deſired.

The Sunne ſhineth upon all planes declining Eaſt before 6 of
lock in the morning; if after 6, the plane declineth Weſt; up-
on South declining how far ſoever it ſhineth at twelve: if not,
he plane declineth North.

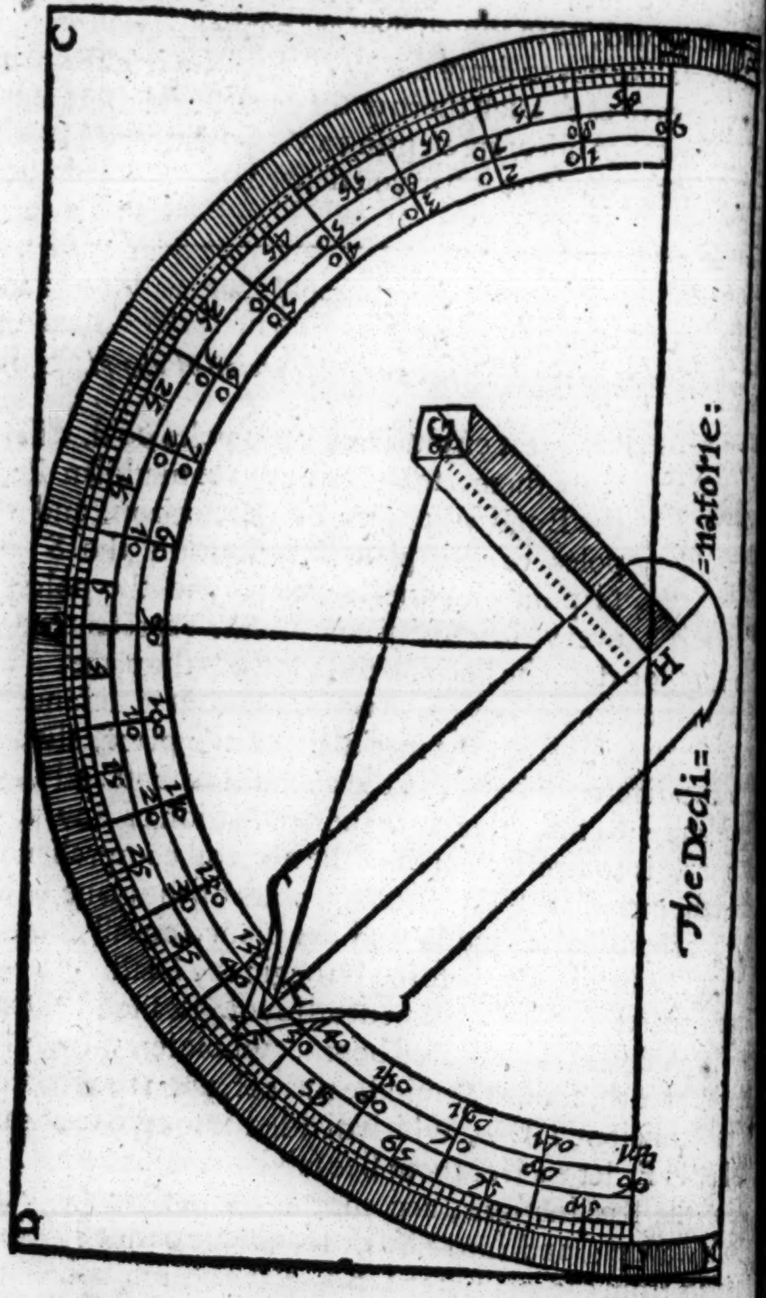
There are many wayes to attaine this declination; the plai-
eſt is by a Needle; but becauſe we have lately found a motion
n the variation, and the Needle it ſelfe is ſo apt by every magne-
icall attraction to be drawn out of his proper place, and there-
by gives a falſe declination, I omit that as very uncertaine: the
beſt way and leaſt ſubiect to error is by comparing the azimuth
of the Sunne and plane together, from whence wee may artifi-
cially argue the true declination thereof.

And this may be three wayes practiſed, two particular on-
ly uſefull in their ſeaſons, the third generall for all times what-
ſoever.

ected at right angles to the line of the lable F H from the
of the perpendicular G to the end of the lable at F make fast

and this may be three wayes practised, two particular on-
ly all in their seasons, the third generall for all times what-
soever.

The


The Decli= =natorie:

rected at right angles to the line of the lable F H from the of the perpendicular G to the end of the lable at F make fast all thred, whose shadow upon the line F H G shall direct true position of the lable.

Vpon the backside of the same draw another semicircle contrick with the former, which divided into two quadrants, h quadrant into 90 d. accounting the first degree from the meter A B, close under the periphery so divided make a holy groove (like the black circle) of such capacity that a small et hanging by a thred from the center, may play at liberty rein, by application of the side D C unto any reclining, and side A B unto any inclining plane, the thred on the backside he instrument doth intersect the degree of reclination and lination, accounting from the diameter A B, without any re trouble, which being plaine and common in use, I leave practice without further directions, only remembring that he board be large enough to receive concentrick circles with gonals, the work proceeding to parts is the more perfect.

But for want of such an instrument, you may with great ease crossing two rulers at right angles, the one paralell to the hoontall line, the other to the verticall line of the plane, give reclination desired.

The Sunne shineth upon all planes declining East before 6 of ock in the morning; if after 6, the plane declineth West; up South declining how far soever it shineth at twelve: if not, plane declineth North.

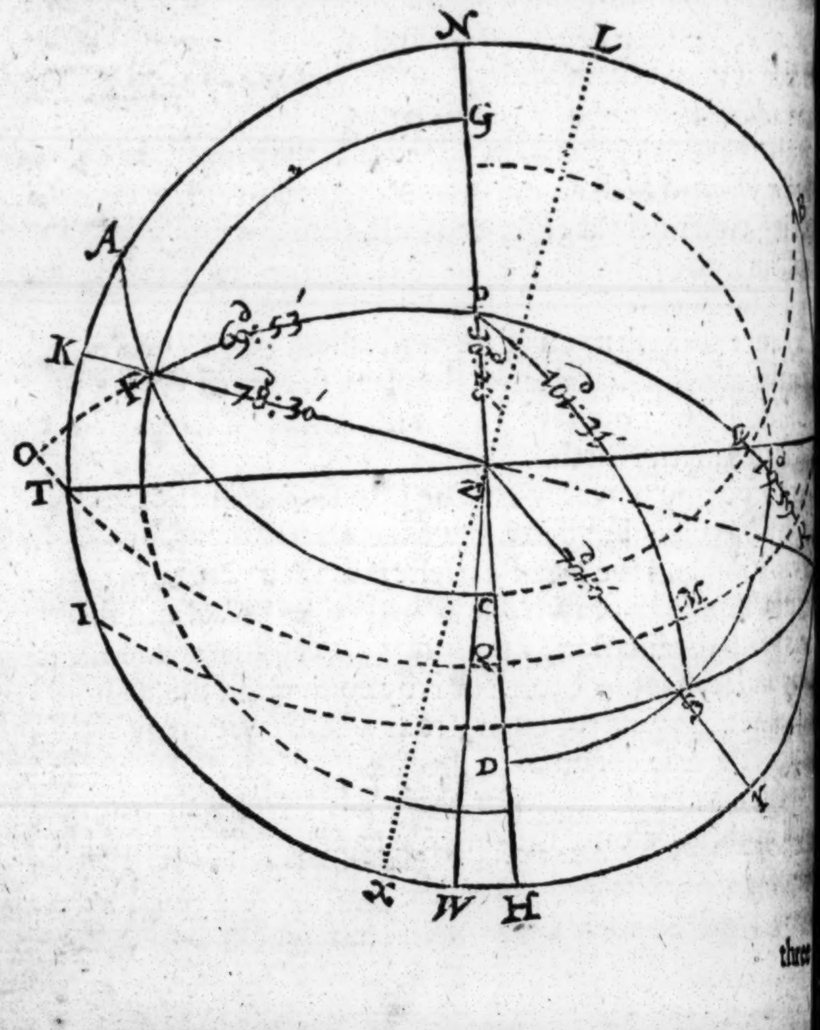
There are many wayes to attaine this declination; the plaist is by a Needle; but because we have lately found a motion the variation, and the Needle it selfe is so apt by every magneall attraction to be drawn out of his proper place, and therey gives a false declination, I omit that as very uncertaine: the st way and least subiect to error is by comparing the azimuth the Sunne and plane together, from whence wee may artifially argue the true declination thereof.

And this may be three wayes practised, two particular onusefull in their seasons, the third generall for all times whatever.

The firſt way.

The firſt particular way is in uſe but from March till Sep ber, during the time that the Sunne continueth in the Nor part of the eclyptick, and is thus.

Firſt by the declination of the Sunne and the elevation of pole given, finde out the heighth of the Sunne upon the E Weſt azimuth, and if you will the houre alſo; that you not wayt too long : In the diagram following N T H V re ſenteth the horizon, N P Z H the meridian, T Z V the p verticall, A C B and I S two paralels of the Sunne, T Q V equator, P F, P E, and P S three meridians, Z F, Z r, and Z



e azimuths, G F, and D S two almicanters, P the pole of e world, and Z the zenith. From P let fall a quadrant, passing the place of the Sunne in E, and cutting the equinoctiall at ht angles in R; R E is the declination of the Sunne, and V E e heighth of the Sunne upon the prime verticall, and R V the ure reckoned from 6 of clock, or the complement thereof Q from 12, the things desired, which you may finde either the small triangle E R V, or by his verticall P Z E, or by e quadrantall Z Q V. Let the declination of the Sunne R E be en on the tenth of May 1622, about 7 of clock in the morng, 19 d. 59', and the elevation of the pole P N, equall to Z Q, d. 32', to finde out E V the heighth of the Sunne, *by the first iety of the eighth case of R. S. Triangles. For,*

		Logar.
As the sine of Z Q the latitude of the place	51 d. 32'	9893.74
Is to the sine of E R the declination of the Sunne,	19 59	9533.70
So is the whole sine Z V	90 0	10000.00
To the sine of E V the heighth of the Sunne desired,	25 53	9639.96

And for the houre in the same Triangle, by the first variety of the fourth case of R. S. triangles.

As the tangent of R Z	51 d. 32'	10099.91
Is to the tangent of R E	19 59	9560.67
So is the whole sine Q V	90 0	10000.00
To the sine of R V	16 48	9460.76

Which 16 d. 48' resolved into time (by allowing 15 d. to an houre, and 15' of a degree to one minute of time) giveth one houre, seven minutes, before or after 6 of clock, according to the time of observation in the morning or evening.

The heighth being found, let a quadrant fitted with sights to that heighth, and observe till the Sunne commeth to it, at the same instant apply the side A B of the Declinatory or semicircle aforesayd unto the plane horizontally supposed to be ∗ L, turne

I the

the labell to the Sunne till the shadow of the thred F G just upon the lines of the labell F H, supposed to stand at prime verticall, then reckon the degrees contayned be the middle line of the semicircle E H, supposed at Y, end of the labell at V; the degrees between Y V, the pole plane and labell standing upon the prime verticall, are the plement of the declination, and between V L the labell plane, the declination it selfe. For seeing that the midd of the semicircle representeth the pole of the plane at Y, plane do not decline, it must needs fall out, that the label ned to the Sunne upon the verticall of East and West, sha ly fall upon the middle line of the semicircle E H, and and Z V in the schem become both one, the plane not de at all, but if (observing in the morning) the labell turned Sunne upon the prime verticall doth fall between E and A semicircle, equall to Y L of the schem, as at V, then is the a South declining East so many degr. as are contayned be V & L the labell and the plane, equall to H Y the meridi pole of the plane; if it fall between E B the other quad the semicircle, equall to x Y, then is the plane a North de East as much. The like may be sayd for evening observati contrary; for if the labell turned to the Sunne fall betw and B of the semicircle, then is the plane a North de West, if between E and A, a South declining West as ma

The second way.

The second way is more generall, and altogether as e somewhat too particular for the time, and that is by att till the Sunne comes into the paralell of the plane, for th in the same azimuth with the plane, and the azimuth of found by his altitude is the true declination of the plane.

First therefore apply the aforesayd semicircle horizon the declining plane, supposed to bee K Z Y, then turne angular labell into the diameter thereof L H K, paralell side A B, attend till the Sunne shadowes just upon the li then take his heighth, by the heighth and declination yo an oblique triangle framed in the diagram adjoyning P F

ree sides whereof are given, to finde the angle at Z, *by the first* *se of O. S. triangles*; for P Z is the complement of P N the ighth of the pole, and Z F the complement of F K the heighth the Sunne, and F P the complement of O F the declination of Sunne, by which I seek the angle P Z F, the azimuth of the ne and plane.

Example, the tenth of May 1622, let O F the declination a-ut 6 ½ at night be 20 d. 7, and K F the heighth of the Sunne out the same time) be 11 d. 30′, to finde the angle Z, *by the* *case of O. S. triangles.*

The base	*P F*	69 d. 53′		
The sides	*Z F*	78 30		
	Z P	38 28		
The summe		186 51	Logar.	
The halfe		93 25 ½	0000.7764	*Arith. compl.*
Differ. base		23 32 ½	0398.5747	
Differ. sides		14 55 ½	9410.8690	
		54 57 ½	9913.1432	
		Tot.	19723.3633	

Whereof the halfe 9861.6816 *Is the tangent of halfe the angle Z from the North,* 36 *d.* 1′ 35″, *and the cotangent of halfe the angle from the South* 53 *d.* 58′ 25″.

Which doubled 72 d. 3′ 10″ is the whole angle N Z K from the North, or the complement thereof 107 d. 56′ 50″ the angle H Z K from the South, both of the Sunne and plane, therefore e azimuth Z F K, under which this plane lieth, representeth e true situation thereof, declining from T the West point of the horizon the angle T Z K 17 d. 57′ *fere*, the complement of N Z K equall to the true declination N L or *x* H reckoned from e meridian N Z H, to the poles of the plane *x* L, 90 d. distant om the plane K Z Y, and is a South declining West 17 d. 57′, or North declining East as much, because the poles of the plane and L fall between the South and West, and North and East parts of the horizon, as by the schem appeareth.

The third way.

The third way by azimuths is generall for all times of th
and of the yeere, but best when the Sunne is not too high,
hath little refraction. Whensoever you would therefore
the declination of any wall or plane this way, first tak
heighth of the Sunne, at the same instant apply the semici
the plane horizontally, which now suppose to bee x Z L,
the triangular labell to the Sunne, and reckon the degrees
tayned between the plane and the labell, which wee
the azimuth of the plane, (in South planes from the South
in North from the North part of the plane) which note.
must you (by the like oblique triangle as before) calculate
zimuth of the Sunne, by these two azimuths compared to
the declination is thus found.

If the labell turned to the Sunne fall just upon the
line of the semicircle, representing the pole of the plane,
is the azimuth of the Sunne counted from the South or N
points of the meridian respectively, the declination of
plane, Easterly or Westerly according to the time of obser
on; but if the azimuth of the plane x Z L, declining East,
x Z V, 107 d. 57', and the azimuth of the Sunne H V 90 d.
H V out of x V, there resteth x H 17 d. 57', the comple
whereof to 90 d. is H Y, 72 d. 3', the declination desi
the azimuth of the plane bee x Z r 54 d. 44', and of the S
H Z r 36 d. 47', take H R out of x R, there resteth x
57', therefore H Y 72 d. 3' as afore. Lastly, if the azim
the plane be x Z W 10 d. and of the Sunne W Z H 7
adde both together, so have you x H 17 d. 57', therefore
H Y 72 d. 3', as afore. Againe, if the azimuth of the plane
declining West, be K Z r 144 d. 44', and the azimuth of
Sunne H Z r 36 d. 47', take H r out of K r, there resteth
107 d. 57', from whence subtract K x 90 d, there resteth
17 d. 57', the declination desired. If the azimuth of the
be K Z W, and of the Sunne W H, adde them together,
you K H, from which subtract K x 90 d. the rest is x H,
clination as afore. Lastly, if the azimuth of the plane be

d the azimuth of the Sunne T H, adde K T and T H together, have you K H, out of which subtract K x 90 d. so have you H 17 d. 57′, the declination as afore.

Note that all these wayes may for necessity bee practised with a ...re board and plumline, without any divisions at all, the angle ...ng taken off from a chord.

Example, in the triangle Z P S, let r S the heighth of the Sun ...re noone be 20 d. 0′, therefore the complement thereof Z S ...d. 0′, the declination of the Sunne Southward S M 11 d. 30′, ...ich added to M P 90 d. maketh the whole side P S 101 d. 31′ ... as before, the complement of the heighth of the pole 38 d. ..., and I seek the angle P Z S, the azimuth of the Sunne, *by the ... Case of O. S. triangles.*

The base P S	101 d.	33′	30″		
The sides { *Z S*	70	0	0		
{ *Z P*	38	28	0		
The summe	210	1	30		
The halfe	105	0	45	0015.0817	} *Arith. compl.*
Diff. of the base	3	27	15	1220.0324	}
Diff. of the sides {	35	0	45	9758.7265	
{	66	32	45	9962.5486	
Totall				20959.3992	

Whereof the halfe 10478.1996 *Is the Logar. of the tangent of halfe the angle Z, from the North* 71 *d.* 36′. 27″, *and the cotangent of halfe the angle from the South* 18 *d.* 23′, 33.

Therefore the double 36 d. 47′ is the whole angle H Z r from the South part of the meridian, Easterly to r, or the complement thereof to 180 d. *vizt.* 143 d. 13′, is the angle or azimuth ... the Sun r Z N, from N, the North part of the meridian to r, ... thing desired.

Now suppose the azimuth of the plane found by the semicir... afore, to be at the same time x r 54 d. 44′, subtract the a...th of the Sunne H r 36 d. 47′, out of the azimuth of the ... x r 54 d. 44′, there resteth x H 17 d. 57′, the difference

 between

between the meridian and the plane, the complement whe[reof] to 90 d. is H Y 72 d. 3′, the difference between the meri[dian] and pole of the plane, the declination desired, as by the de[finiti]on thereof appeareth, and is a South declining East 72 d. 3′, [or] North declining West as much, because the poles of the p[lane] K and Y fall between the south and east, or north and west, [as] in the schem appeareth.

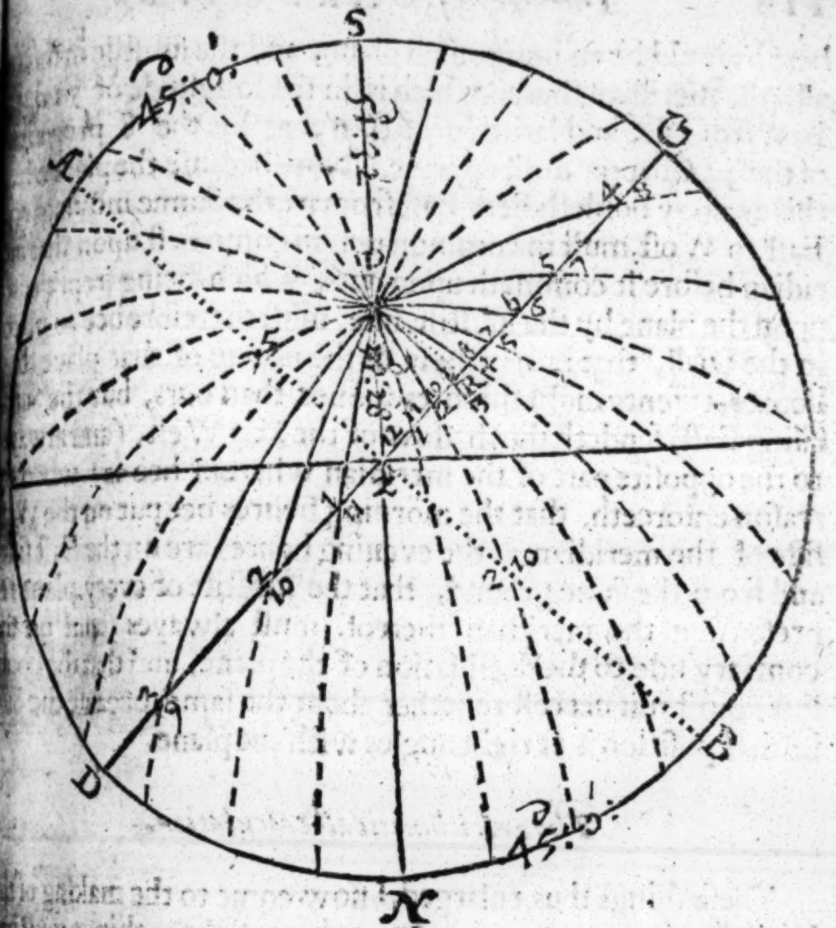
CHAP. X. The second part.

How to draw the houre lines upon a South or North erect p[lane] declining East or West, to any declination given.

EVery erect plane lieth under some azimu[th or] other; and those only are sayd to decline w[hich] differ from the meridian and prime vertical.

The Demonstration.

The declination therefore being thus attayned, (or by [any] other meanes you like best) then make the schem by the [rule] of the fourth Chapter; (which being inverted is the same, [both] for north and south declination) wherein as before S E N [W is] the horizon, S P Z N the meridian thereof, S the south p[oint, N] the north, E Z W the azimuth of East and West, G Z D [the] declining plane, the poles whereof are B and A the decli[nation] from the south easterly, or north westerly S A, or N B 45 [d.] so much doth the plane D Z G decline from W and E; the [West] and East points in the schem, the houre circles drawn, (a[s be]fore) and proper to this plane, are the black lines passing th[rough] the pole P, and crossing upon the plane G Z D, where[in note] generally, that where they runne neerest together, there[abouts] must the stile stand, and alwayes on the contrary side to th[e de]clination, as in this example declining East, it therefore [stand]eth on the West side, (supposing P to bee the South pole) [be]tween Z and G, the reason whereof doth manifestly appe[are]



First in the schem, wherein the plane declining Eastwards, the morning houres, together with the substile P R fall on the West side thereof by the work, and contrary: for the houre lines remayning fixed, if you suppose the axis A Z B, and the plane it selfe G Z D, (crossing each other at right angles) to bee moveable, and turned about upon the center Z, till A Z B come into the place of G Z D, then will the declination be Westerly, and the plane standing in the place of the axis A Z B, will receive the afternoone houres in the prickt lines, running together on the East side, with the same angles that now declining East, they do on the West side thereof. But the true reason is drawn from the situation of the place, where the plane on which this Diall is made, (wrested out of the true forme, to serve our turne

here) would be an horizontall plane, and the substile in th
all, the meridian there, which is in the longitude of 51 d.
East from us, and latitude 26 d. 6', as by the 8 propo
of the 34 Chapter doth appeare. Now because the place w
this analogy holdeth, lieth East from us, the Sunne moving f
East to West, must in common reason come first upon that
ridian before it commeth upon ours, which being represe
upon the plane by the substile line, must therefore bee so pl
in the Diall, that it may shew us the noone of that place t
houres, twenty eight minutes sooner than ours, but the Su
rising East, sendeth the shadow of the axis West, (and alw
to the opposite part of the meridian wherein hee is) whe
reason enforceth, that the morning houres bee put on the W
side of the meridian, as the evening houres are on the East
and from the same ground, that the substile of every pla
presenting the meridian thereof, must alwayes stand on
contrary side to the declination of the plane, and that the h
lines must run neerest together about the same, because the
in that position is at right angles with the plane.

The Arithmeticall calculation.

These things thus enlarged, I now come to the making
Diall, for the better performing whereof three things mu
first found; *vizt.*

1 The elevation of the pole above the plane, represent
P R, which is the heighth of the stile, and is an arch of the
ridian of the plane betweene the pole of the world a
plane.

2 The distance of the substile from the meridian, repr
ted by Z R, and is an arch of the plane between the meri
and the substile.

3 The angle Z P R betwixt the two meridians, *viz.*
substile P R, the meridian of the plane, and the line P Z N
meridian of the place, and they are thus found.

Because the substile is the meridian of the plane, it m
part of a great circle passing thorow the pole of the world,
crossing the plane at right angles, therefore in the supposed

gled triangle P R Z, (for yet the place of R is not ſound) you
e the baſe P Z 38 d. 28′ given, and the angle P Z R the com-
ment of the declination 45 d. and the ſuppoſed right angle
R, to finde the ſide P R, which is the heighth of the ſtile (as
reſayd) but yet the place of it unknown.

Wherefore by the firſt variety of the firſt caſe of right angled
ericall triangles, I ſay,

First,			Log.
the ſine of P R Z	90d.	0′	10000.0000
to the ſine of the ſide P Z	38	28	9793.8317
is the ſine of the angle P Z R the compl. of the declinat.	45	0	9849.4851
To the ſine of the ſide P R	26	6	9643.3168

Which 26 d. 6′ is the heighth of the ſtile above the plane.

Secondly you may finde the diſtance of the ſubſtile from the
meridian Z R, by the ſecond variety of the fourth caſe of R. S.
triangles, or the ſecond of the third. For,

Secondly,			Logar.
As the tangent of S G the meaſure of the angle Z	45d.	0′	10000.0000
Is to the tangent of P R	26	6	9690.1029
So is the Radius G Z	90	0	10000.0000
To the ſine of R Z	29	20	9690.1029

Which 29 d. 20′ is the diſtance of the ſubſtile from the meri-
dian.

Theſe things given, the angle at P between the two meridi-
ans is found by the ſecond variety of the 12, 13, 14, or 16 Caſes
of R. S. triangles. For,

	Thirdly,		Logar.
As the ſine of Z P	38d.	28′	9793.83
Is to the ſine of Z R P	90	0	10000.00
So is the ſine of Z R	29	20	9690.09
To the ſine of Z P R	51	57	9896.26

Having

Having found the angle between the meridians to bee 51 57', you may conclude from thence, that the substile shall between the third degree and fourth houres distance from meridian of the place, and therefore between 8 and 9 of cl in the morning, because the plane declineth East from us, 9 clock being 45 d. from the meridian, and 8 of clock 60 d. stant, therefore now let fall a perpendicular between 9 and to enform the fancy in the rest of the work, & this shall make the triangle before mentioned, & supposed P R Z, which be found, there are 2 wayes to calculate the houres arithmetic The first by oblique sphericall triangles (the fift Case) requi two works to every houre, for in the oblique triangle P Z you have the angle at P given, 15 d. in the equator, and the gle at Z given, 45 d. in the horizon, and the side comprehen between them P Z 38 d. 28' on the meridian, to finde the Z 1 1, the first houres distance from the meridian upon the p and so must you proceed with all the rest, but this being tedious, I omit. The second way is both easie and plea the former things being first found, for by help of the angle tween the meridians at P and the heighth of the stile P R, may finde all the houre distances as easily as you did in the So Diall, or if you will every two houres 90 d. distant one fr the other, by one subtraction and addition of the same n bers, or by two additions as you did in the horizontall.

And here you may note, that in the former work you f all the houres from the meridian of the place, but where use the help of the angle between the two meridians, you f the distance of all the houres from the substile each way, wh is the meridian of the plane.

Data,	Elevation of the pole S P	$51^d.32'$	
	South declining East S A	45	0

Quæsita,	Heighth of the stile P R	26
	Distance of the substile and meridian Z R	19
	Angle between the meridians R P Z	51

Ho

Houres and parts from the substile.		Equinoctiall distances.	Logarithmes of tangents.	True houre distances	Differ.
9	3	6^{d}.57′	8729.32	3^{d}. 4′	
	½	14.27	9054.41	6.28	3^{d}.24′
10	2	21.57	9248.63	10. 3	3. 35
	½	29.27	9395.07	13.57	3. 54
11	1	36.57	9519.64	18.18	4. 21
	½	44.27	9634.97	23.20	9. 2
12	12	51.57	9749.72	29.20	6. 00
	½	59.27	09872.30	36.42	7. 22
1	11	66.57	10014.41	45.57	9. 15
	½	74.27	10198.86	57.41	11.44
2	10	81.57	10492.77	72.11	14.30
	½	89.27	11661.06	88.46	16.35

Houres and parts from the substile.		Equinoctiall distances.	Logarithmes of tangents.	Houre arches on the plane.	Differ.
	½	0^{d}.33′	7625.57	0^{d}. 15′	
8	4	8. 3	8793.86	3. 34	3^{d}.19′
	½	15.33	9087.77	6. 59	3. 25
7	5	23. 3	9272.22	10. 36	3. 37
	½	30.33	9414.33	14. 33	3. 57
6	6	38. 3	9536.90	19. 0	4. 27
	½	45.33	9651.65	24. 9	5. 9
5	7	53. 3	9766.99	30.19	6. 10
	½	60.33	9891.55	37.55	7. 36
4	8	68. 3	10038.00	47. 30	9. 35
	½	75.33	10232.22	57.38	12. 8
3	9	83. 3	10557.32	74. 31	14.53

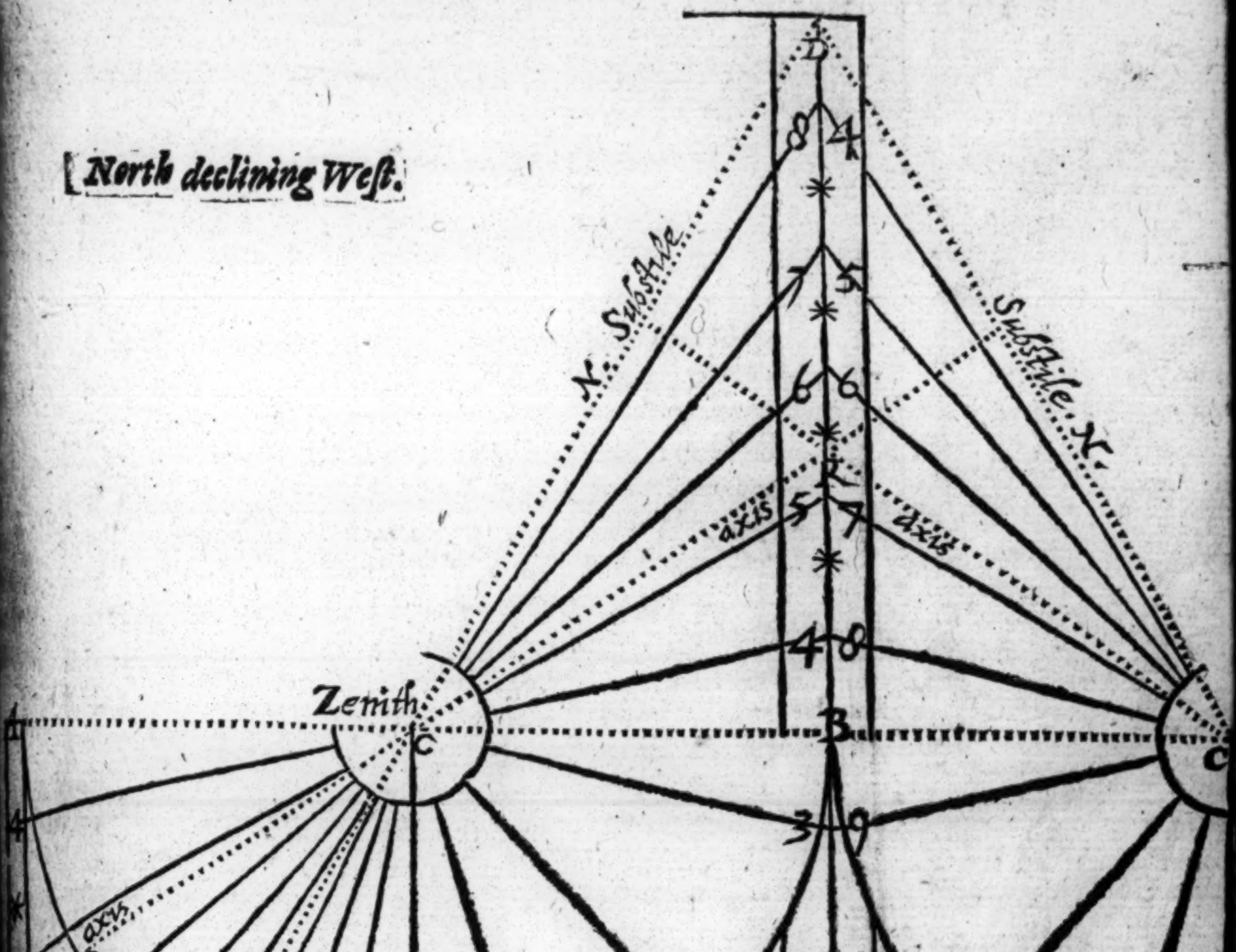
Now therefore make a table for the houres distance, as formerly you have done, excepting that here you reckon the houres forwards and backwards from the substile, as you did before from the meridian; beginning with 9, 10, 11, 12, 1, 2, on the one

one side; and so proceeding with 3, 4, 5, 6, 7, and ending
8; on the other side; then set unto every houre and part
quinoctiall distance thereof from the substile : which is the
gle at P, between the substile and every houre; wherefo
9 of clock (the distance whereof is 45 d. from the meri
subtract 45 d. out of 51 d. 57′, the distance of the substile f
the meridian, and there will remaine 6 d. 57′, the distanc
9 of clock from the substile; also because 8 of clock is 60 d.
stant from the meridian, which is more than the distance of
substile, take 51 d. 57′ out of 60 d. there will remaine 8 d. 3
distance of 8 of clock from the substile; all the rest of the ho
and parts are easily found, by continuall addition of 15 d.
an houre, of 7 d. 30′ for halfe an houre, and of 3 d. 45′ f
quarter, as by the table it selfe doth plainly enough appeare.
being prepared, I returne againe to the schem, wherein I
the right angled triangle 9 P R to resolve, therein P R is g
the heighth of the stile 26 d. 6′, and the angle 9 P R is give
afore, 6 d. 57, and the right angle at R, to finde the side
by the first variety of the fift Case of R. S. triangles. For,

			Logar.
As the sine of P R Z	90 d.	0′	10000.00
Is to the tangent of R P 9	6	57	9085.99
So is the sine of P R	26	6	9643.32
To the tangent of R 9	3	4	18729.31

Then againe subduct the tangent of R P 9 out of the sine
R P and the Radius, and there shall come forth a Logar. tang
10557.33 the arch whereof is 74 d. 31′ the true houre dist
of 3 of clock at the same work, [redacted], which is 90 d.
stant from 9 of clock.

But if this rule seem troublesome, follow the other, which
both plaine and easie, and performes all by addition only. F
againe in the schem having done with the small triangle R P
now work with the complement to 90 d. R P 3, *by the form*
Case of R. S. triangles. For,



South declining East.

South declining

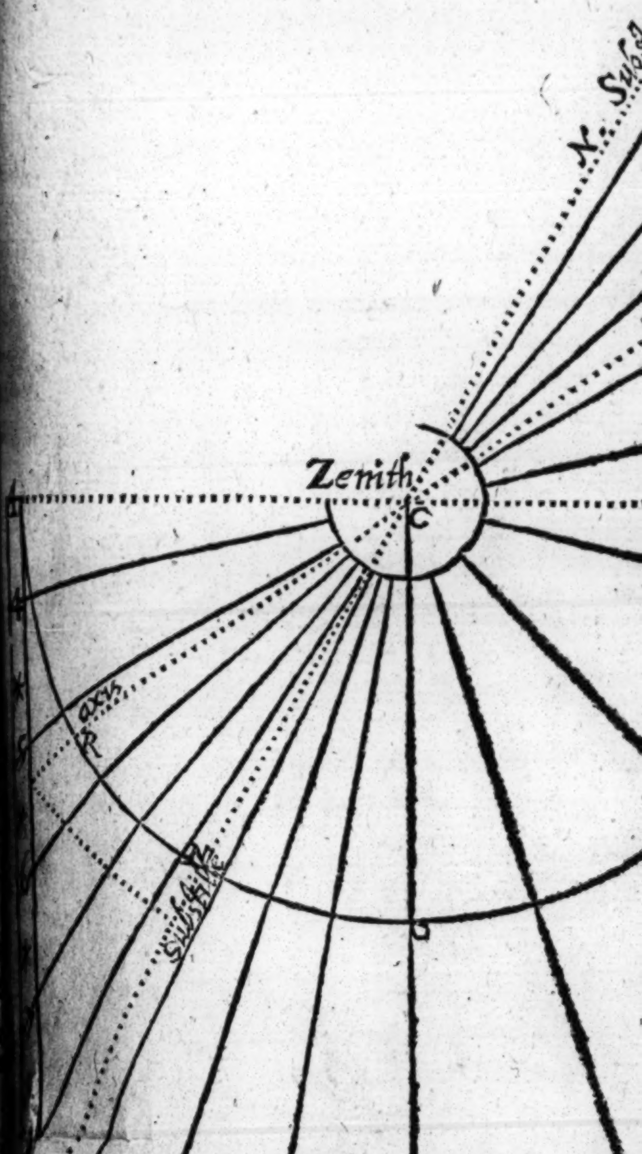
Place this folio 117.

proceeding with 3, 4, 5, 6, 7, and ending
ide; then set unto every houre and part th
ce thereof from the substile: which is the
n the substile and every houre; wherefor
istance whereof is 45 d. from the meridi
of 51 d. 57′, the distance of the substile fr
d there will remaine 6 d. 57′, the distance
e substile; also because 8 of clock is 60 d.
eridian, which is more than the distance of
. 57′ out of 60 d. there will remaine 8 d. 3′
ock from the substile; all the rest of the hou
y found, by continuall addition of 15 d.
30′ for halfe an houre, and of 3 d. 45′ for
table it selfe doth plainly enough appeare. T
returne againe to the schem, wherein I h
riangle 9 P R to resolve, therein P R is gi
stile 26 d. 6′, and the angle 9 P R is give
the right angle at R, to finde the side 9
of the fift Case of R. S. triangles. For,

		Logar.
Z	90 d. 0′	10000.00
f R P 9	6 57	9085.99
	26 6	9643.32
9	3 4	18729.31

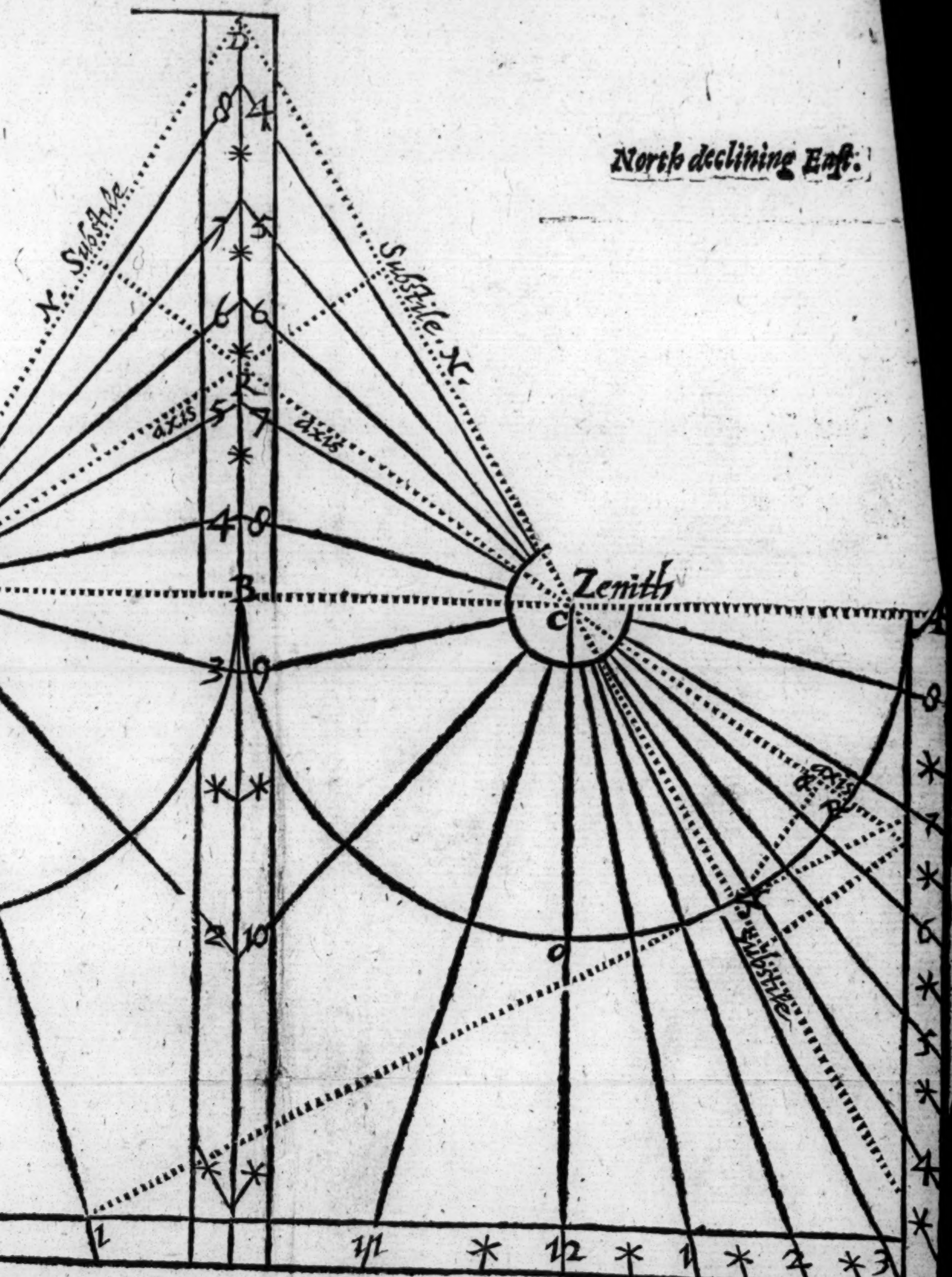
duct the tangent of R P 9 out of the sine
s, and there shall come forth a Logar. tange
n whereof is 74 d. 31′ the true houre dista
same work, [redacted], which is 90 d.
ck.
eem troublesome, follow the other, which
ie, and performes all by addition only. Fo
having done with the small triangle R P 9
e complement to 90 d. R P 3, *by the form*
les. For,

North declining West.



South declining East.

North declining East.



South declining West.

Place this folio 117.

		Logar.
As the sine of P R Z	90^d. 0'	10000.00
Is to the tangent of R P 3	83 3	10914.00
So is the sine of P R	26 6	9643.32
To the tangent of R 3	74 31	19557.32

which produces againe the same houres distance as afore.

Now there being no variety in all the rest of the work, but only changing the angle at P, according to every houres distance from the substile, it is needlesse to reiterate the same; therefore transcribe into a paper the Logarith. sine of 26 d. 6', the heighth of the stile P R, which is 9643.39, for that being continually added unto the Logarith. tangents of every houres equinoctiall distance from the substile, doth beget new Logarith. tangents, whose arches are the true houre distances upon the declining plane G Z D. Thus if you adde to the Logarith. tangent of the 11 houres distance 36 d. 57', 9876.32 the Logar. sine of P R 9643.39 (which you may do in the booke without writing them down) there will come forth a new Logarith. tangent 19519.64, which giveth the true houre distance for 11 of clock, 18 d. 18'. In the same place remove this Log. sine to the Logarith. tangent of the complement 53 d. 3', the equinoctiall houre distance of 5 of clock, 90 d. distant from 11, and adde them two together, and you shall produce a new Log. tangent of 19766.99, which gives the true houre distance for 5 of clock 30 d. 19'; and thus you must proceed with all the rest, as you see done in the table aforementioned.

The Geometricall projection.

Having thus easily calculated all the twelve houres at six operations, draw a line paralell to the horizon A C B, crosse it at right angles in C, the lines C O 12 shall be the meridians. Take 60 d. of the chord, and making C the center, draw the semicircle A O B, representing the azimuth G Z D of the schem, in which the plane lieth; upon this circle from O to N set of the distance of the substile from the meridian, which was found before to be 29 d. 20', and that upon the West side of the meridian

an when the declination is East, on the East side when We[sterly]. Then take off the same chord the severall houre dista[nces as] they are ready calculated in the table, *vizt.* 10 d 36' for 7 [and 5] of clock, 18 d. 18' for 11 and 1 of clock, and so of the rest, [and] set them both wayes from the substile upon the circle R [N,] as the table it selfe directeth; draw streight lines from the [cen]ter C to these severall points, so haue you the true houre [lines] which were desired: Lastly, take off the same chord the hei[ght] of the stile found to bee 26 d. 6', which being set from N [to R,] and a streight line drawn from C thorow R, representing [the] axis, the Diall is finished for use.

In applying it to any wall or plane, let A C B be horizo[ntall,] C O perpendicular, and the side or axis of the stile C R p[oint]ing to the South pole in South Dials, and to the North pole [in] North Dials, erected at right angles over the substile line C [N,] so have you fitted a Diall for any South plane declining 45 [d.] Easterly.

And now you have in this one Diall made foure togeth[er,] *vizt.* a South declining East and West 45 d. and North de[cli]ning East and West as much, only placing the numbers of t[he] houres and the stile respectively upon each plane. To m[ake] this plainly appeares out of the former schem, suppose th[at S] were againe the North part of the horizon, and P the N[orth] pole, and that G Z D were a north declining plane 45 d. W[est,] as much as the pole A is from S, then do all the houre ci[rcles] crosse the same plane as they did the former, only D 2 Z w[hich] was in the former the East side and afternoone houres, w[ill] now be D 10 Z, the West side and forenoone houres, and s[o of] the rest; the stile also, which in the East declining stood [be]tween 9 and 8 of the forenoone houres, will now in the W[est] declining stand between 3 and 4 of the afternoone houres. [And] lest there should yet be any doubt conceived, I have draw[n] the foure Dials aforesayd, wherein you may plainely see [that] there is no difference at all between the South declining E[ast] and the South declining West, but that the forenoon hou[res on] the left hand of the meridian in the East Diall are become [the] afternoon houres on the right hand of the meridian in the [West] Diall, and contrary, the stile also of necessity changing the p[lace]

with the houres for the reasons aforesayd.

And here you may also observe each North Diall framed out of the correspondent South, only drawing the houre lines of the South Diall thorow the center stile and all, *vizt*. the N E out of the S W, and the N W out of the S E, supposing B C D drawn out of the S W Diall, to bee placed upon the N E side of the plane, and B C D drawn out of the S E Diall, to bee placed on the N W side of the plane, according to the true nature and declination of each plane, seeing it followeth of necessity that the South side of the plane declining West, the North side thereof declineth as much East, and contrary, and this also holdeth in the rest of the lineaments belonging to each Diall.

Lastly, one thing more may bee noted, naturally arising out of this schem, which few other will afford, *vizt*. all the foure Dials ready drawn upon it, a good argument to prove the analogy of them, *(mutatis mutandis)* for the South declining East, & the North declining West, are represented by the line G Z D, supposing the one side of it according to the site of the Poles A and B, to respect the North, and the other side the South, as before; and in the very same manner imagine B Z A to bee the declining plane, and G D the poles thereof, then have you S G a south declining west, and N D a north declining East 45 d. and the prickt houre circles, with the very same angles crossing the plane B Z A, as formerly the black lined circles did G Z D, for the houre circles falling from P upon D Z G in the south declining east, and north declining west ; as also upon B Z A in the south declining west, and north declining east, have like and equall intersections, as by the bare inspection of the schem doth appeare. From these reasons I conclude, all these kindes of Dials to be but one ; and note that in the table I have set the houres of west and east declining together, that it may serve for both turnes, seeing the houre arches upon the planes have the same angles and distances in both. Now because these kindes of Dials are of all other most common in use, and to make them the more conspicuous to every mans eye, they are usually drawn very large, in which case it is convenient to use a rod for the stile instead of a plate ; which being made of equall greatnesse, the whole length like a cylinder, the shadow of the upper part

towards

towards the center (in Dials that have centers upon the p
will crosse the houre lines when the shadow of the lowe
will not touch the same, and for this cause some do conceiv
Diall to bee false made, not considering that the middle o
shadow shewes the true houre, and nether side of the same
help this, you may make the stile tapering, largest at the lo
end, and so growing lesse towards the center, as the houre l
do in the Diall; for seeing the meridians are equidistant in
equator, and the houre lines upon the plane, whether bro
or narrower, are equall in time; from the diameter of the g
ter end (which is arbitrary) draw two streight lines, to
in a point at the length of the stile, so shall it bee proportio
that the shadow may touch the houre lines all at once, yet c
sidering that neere the substile a smaller stile will serve the
whose shadow at the distance of the remotest houre upo
plane will vanish, not making an angle of 30', it will bee f
know what must bee the least proportion of the stile, to g
shadow unto all the houre lines of the plane. Suppose the
an equinoctiall line to bee drawn upon the plane, at wh
stance you will from the center, crossing the substile at r
angles, and the houre of 10 produced beyond the plane, a
the line 1 N 7, in the former Diall, at the distance of N C,
parts of an inch, (accounting an inch to a foot.) Next seeke
length of the Radius of this equator N æ in the same parts *b*
first Case of R. P. triangles.

				Logar.
As the sine of N æ C	90^d.	0'		10000.0000
Is to N C	175		+	0243.0380
So is the sine of N C æ	26	6	+	9643.3926
To N æ	7699		—	9886,4306
	Charact. Compl. 0.			

Therefore the length of N æ is next hand 77 centesmes o
inch, which being the Radius, the equator is a tangent line
unto, and the distance of the houre of 11 upon the eq
shall bee the naturall tangent of 66 d. 57', and the houre o
(the remotest crossing the equator) shall bee the naturall t
gent of 81 d. 57' 707059, as appeares in the table; and this f

foot of the ſtile, but from the top of the ſtile, which ſerveth purpoſe, it is the ſecant thereof 7140096, wherefore *by the* *and caſe of R. P. triangles.*

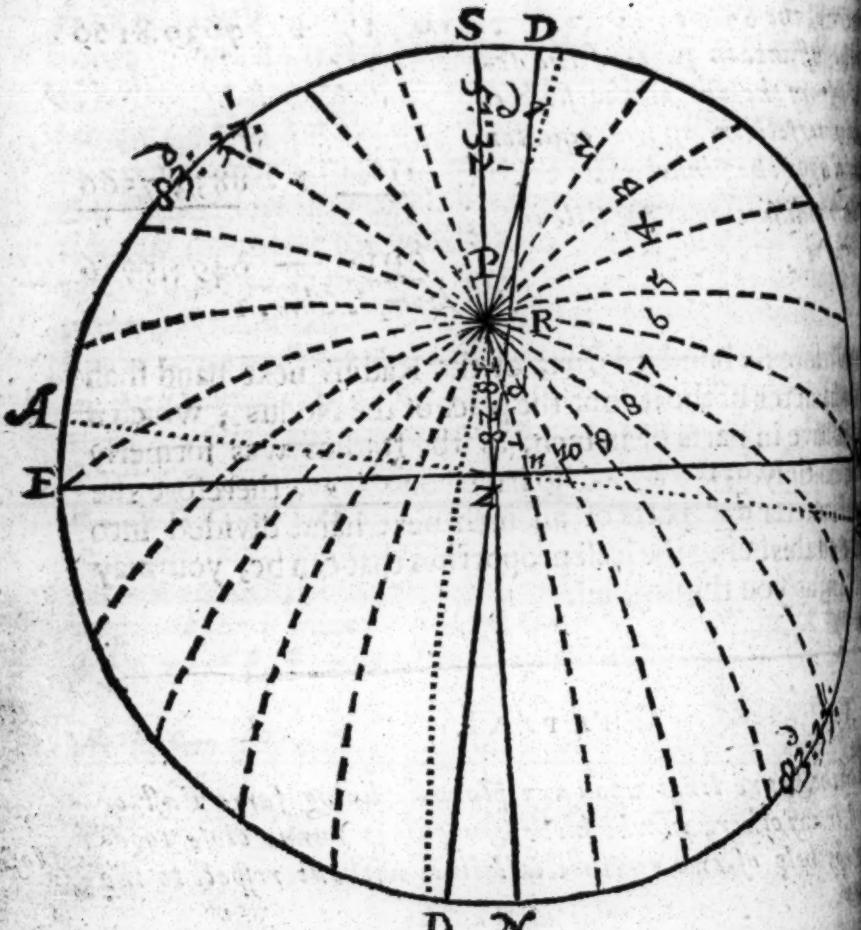
the Radius, ſuppoſed to be the diſtance from the Sun to the plane	. .		10000.0000
to the tangent of the ſemidiameter of the Sunne . . .	0^d 15′	+	7639.8160
is the diſtance in parts of the ſecant from the top of the ſtile to the interſection of the equator and x upon the plane . .	714096	+	8853.7566
the ſemidiameter of the ſtile in like parts	03116	—	0493.5726
	Compl. Char. 1.		

Wherefore ſix hundred parts of the Radius next hand ſhall the diameter of the ſtile at the place of the Nodus ; which if will have in parts of an inch, as the Radius was formerly d, multiply 03116 by 77, ſo have you 02399, therefore the ole diameter 048 parts of an inch next hand divided into . And this being the leaſt proportion that can be, you may ale it, as you think good.

Chap. XI.

To draw the houre lines vpon any plane declining farre Eaſt or Weſt, or any other, in which the houre lines runne cloſe together, by help of two equinoctiall lines without reſpect to the center.

Efor I paſſe from declining planes, I think it fit to ſhew the making of thoſe Dyals which by reaſon of their great declination have ſo ſmall elevation of the ſtile, that the houre lines running cloſe together, are of little uſe without ſome other help. Such any both recliners and declining recliners, but chiefly all


S
D
P
R
A
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Z
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N

[ho]le, that decline East or West 80 d. and upwards. In which [so]me of the houre lines are but few minutes asunder, and the [ne]erer the declination is to 90 d. the narrower are the houre [lin]es, as by the schem it selfe and this example following will [m]ore plainly appeare. To remedy this, the ordinary way is [w]ith a beame compasse of 16, 18, or 20 foot long, upon a [lar]ge floure to draw the Diall, and then to cut off the houres, [sti]le and all, at 10, 12, or 14 foot distance from the center, as [w]ill best fit the plane, but this being too mechanicall for them [th]at have any trigonometricall skill, I omit, and rather com-[me]nd the way following, by help whereof you may upon halfe [a s]heet of paper make a perfect modell of your Diall, to what [gr]eatnesse you think fit, without regard at all to the center.

The Demonstration.

Suppose therefore that the wall or plane D Z D, on which [yo]u would make a Diall, declineth from S to A, that is, from [So]uth Easterly 83 d. 37′: Having drawn the schem by the [ru]les of the fourth Chapter, agreable to this declination, (as [is o]nce done in this example) set downe the *data*, and by them [se]eke the *quæsita*.

[Dat]a	Elevation of the pole P S	51^{d}.32	
	Declination S A South Easterly	83	37
[Quæ]sita	1 Heighth of the stile P R	3	58
	2 Distance of the substile and meridian Z R	38	18
	3 Angle of the meridians Z P R	85	0

And you shall finde the heighth of the pole or stile P R above [the] plane to be 3 d. 58′, *by the first of the first case of R. S. trian-[gles]*. The substile from the meridian Z R to be 38 d. 18′, *by the [first o]f the fourth case of R. S. triangles*. And the angle between [the m]eridians Z P R, to be 85 d. 0′ next hand, *by the second of [the fi]fteenth case*; which angle shewes that if the substile were [draw]n, at the distance of 38 d. 18′ from the meridian, it would [be] within five degrees of 6 of clock upon the equator, crossing [the s]ubstile at right angles.

The first Table for $83^d\ 37'$.						
Houres and parts.		*Equinoctiall distances.*		*The true houre distances.*		*Naturall tangents.*
4	0	35^d	$0'$	2^d	$46'$	0483
	¼	31	15	2	24	0419
	½	27	30	2	4	0361
	¾	23	45	1	45	0305
5	0	20	0	1	27	0253
	¼	16	15	1	9	0201
	½	12	30	0	53	0154
	¾	8	45	0	37	0108
6	0	5	0	0	21	0061
	¼	1	15	0	5	0014
	½	2	30	0	10	0029
	¾	6	15	0	26	0075
7	0	10	0	0	42	0122
	¼	13	45	0	58	0168
	½	17	30	1	15	0218
	¾	21	15	1	32	0268
8	0	25	0	1	51	0323
	¼	28	45	2	10	0378
	½	32	30	2	31	0439
	¾	36	15	2	54	0507
9	0	40	0	3	19	0579
	¼	43	45	3	47	0661
	½	47	30	4	19	0755
	¾	51	15	4	56	0863
10	0	55	0	5	38	0986
	¼	58	45	6	30	1139
	½	63	30	7	34	1328
	¾	66	15	8	56	1572
11	0	70	0	10	45	1899
	¼	73	45	13	21	2373
	½	77	30	17	20	3121
	¾	82	15	24	12	4494
12	0	85	0	38	19	7902

The Arithmeticall calculation.

Now therefore make a table of houres, halfes, and quarters, you think good, according to the first example, wherein eve- houres true distance and part, is calculated by the rules of the rmer Chapter, and necessary if you work from a supposed nter, but beginning from the equator, you shall not need to ke the paines, the equinoctiall distances alone from the sub- ile, and their naturall tangents (both which are had without oubt of calculation) being altogether sufficient for this turne, you may see in the second Table. Adjoyne therefore unto ach houre and part the equinoctiall distance thereof from the substile, *vizt.* for 6 of clok 5 d. for 5 of clock 20 d. for 7 of clock 10 d. for 8 of clock 25 d. and so of the rest, as you see in the example; and unto them adde the naturall tangents of each houres distance, so is the table prepared for use, by which you may easily frame the Diall to what greatnesse you will after this manner.

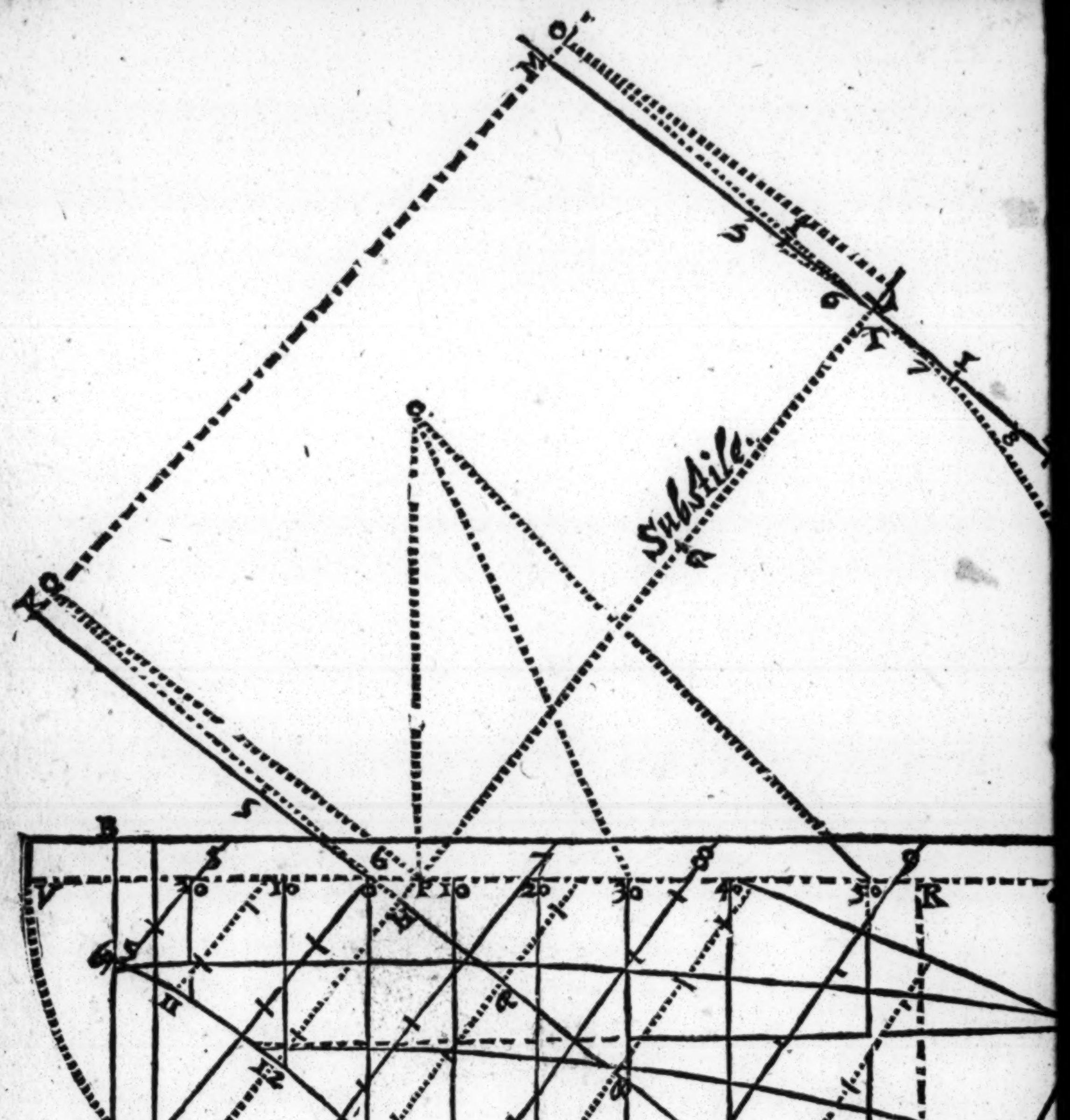
he second Table of $83^d\ 37'$.

	Houres and parts.	*Equino-ctiall di-stances.*		*Natu-rall tan-gents.*
4	8	35	0	700
	½	27	30	520
5	7	20	0	364
	½	12	30	221
6	6	5	0	087
	½	Substile		
		2	30	044
7	5	10	0	176
	½	17	30	315
8	4	25	0	466
	½	32	30	637
9	3	40	0	839
	½	47	30	1091
	2	55	0	1428
	½	62	30	1921
	1	70	0	2747
	½	77	30	4511
	12	85	0	11430

The Geometricall projection.

Proportion the plane B C D E, whereupon you will the Diall, to what ſcantling you think fit, as here it is to foot, and ſeven foot, allowing for the ſcale an inch to a let V R d paralell to B E, be the horizontall line drawn you will, upon any part thereof, as at P, make choice of place for the perpendicular ſtile, (though afterwards you uſe another form) neere about the upper part of the plane cauſe the great angle between the two meridians maketh ſubſtile which muſt paſſe thorow the point P, to fall ſo the 6 of clock houre, that you can put but one houre above if you will bring 11 of clock, more uſefull than 4, into plane; let P be the center, and with any chord (the greater better) make two obſcure arches, one above the horizontall line, the other under the ſame; off the ſame chord take 51 the angle between the ſubſtile and horizon (which is the complement of the angle between the ſubſtile and meridian) ſet it from V to T both wayes, draw the ſtreight line TP which ſhall be the ſubſtile of this Diall. This done, ſuppoſe equinoctiall line in your imagination, (or draw a dotted if you will) cutting the ſubſtile at right angles, as neere the place as you can gueſſe, upon which proportion the diſtance either of the extreme houres of the Dyall, as great or as little may juſtly fill the plane: for example, let 5 of clock be of an inch from the ſubſtile (which is 9 inches off, accounting inch to a foot)&I would find out the length of the radius agreeable thereto, by which to try if the other extream houre alſo fall out conveniently upon the plane, wherefore *by the ſecond caſe of R. P. triangles*, I ſay,

		Log
As r H the tangent of 20 d. the equinoctiall diſtance of 5 of clock from the ſubſtile	+	956
Is to the line r H 075 parts	—	0124
So is the radius H G upon the ſubſtile . . .	+	1000
To the line H G, or H O, 2061 parts . .	+	0314



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di- Loga
+ 9561
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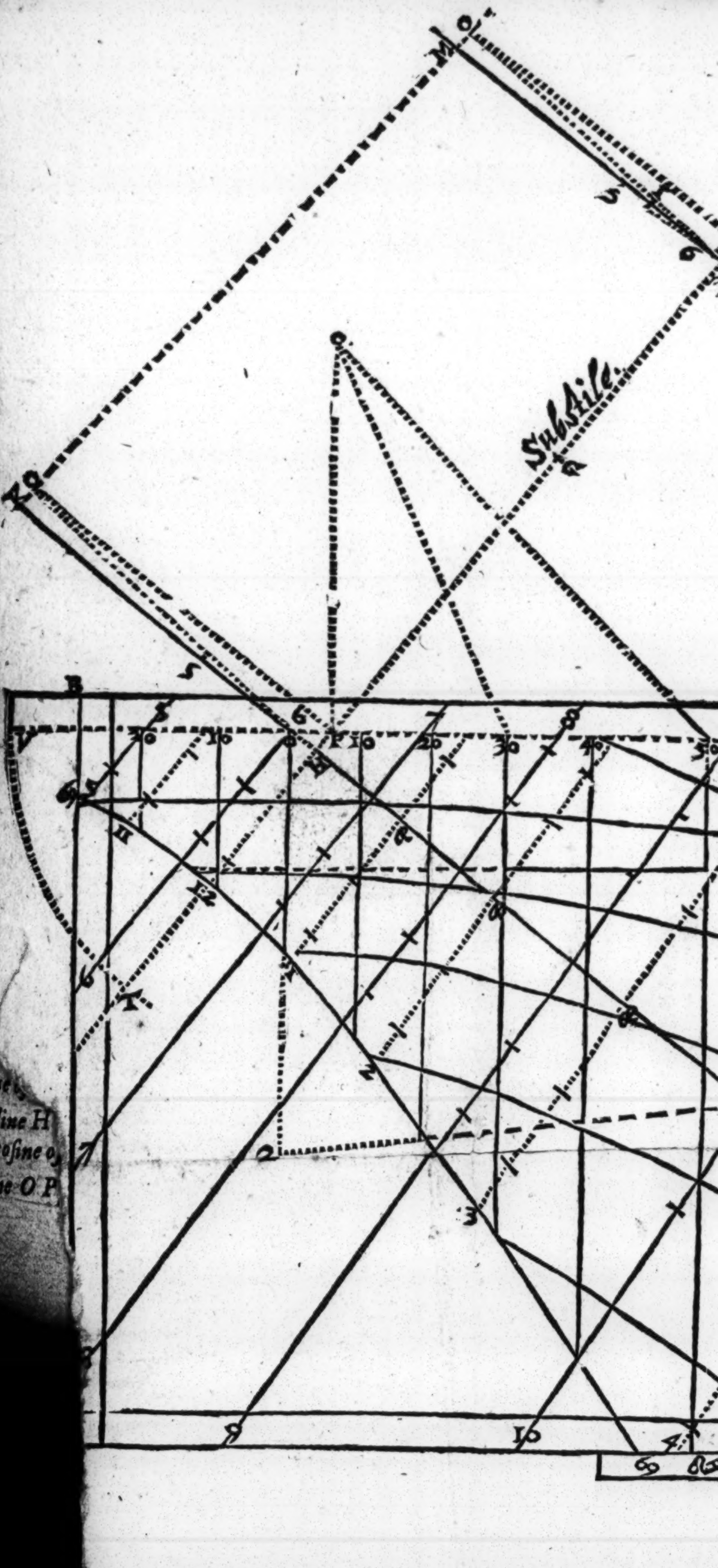

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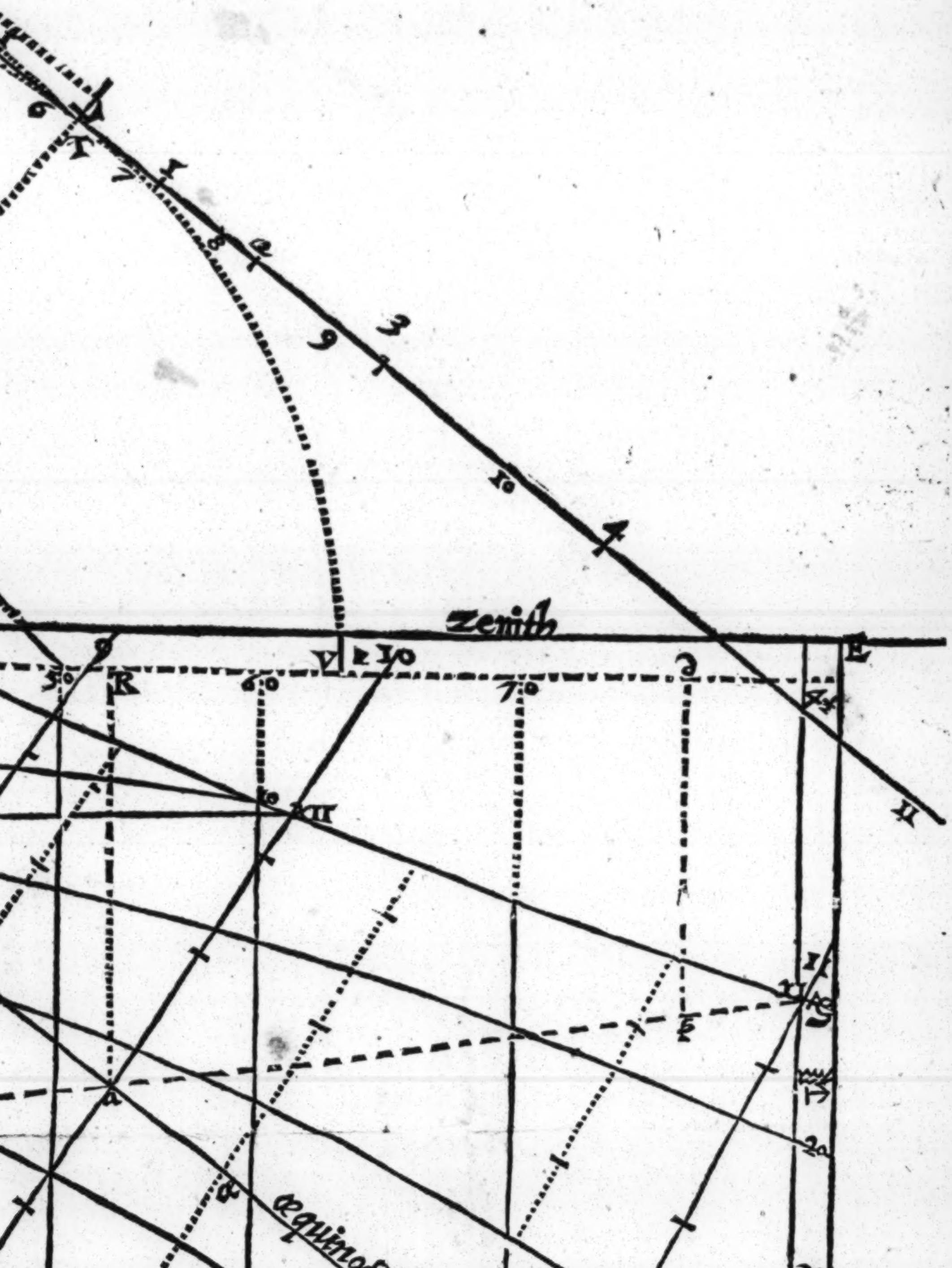

s folio 126.

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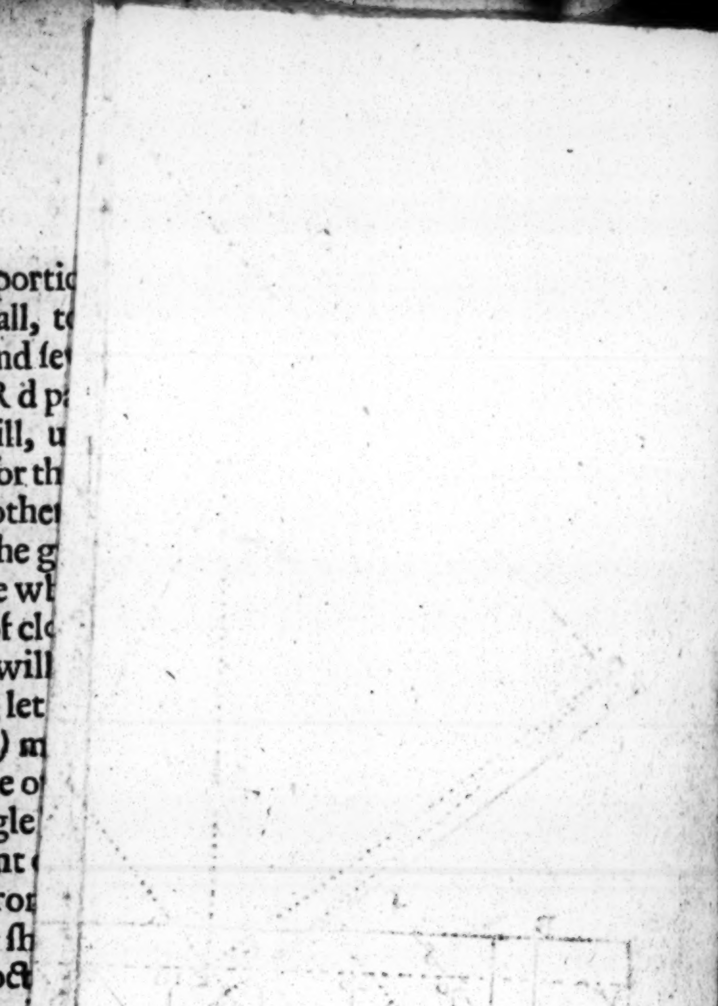


As r
stan
Is to t
So is th
To the line H G, or H O, 2061 parts

Or by the same case,

		Logar.
the sine of r G H 20 d.	+	9534.0516
the line r H 75 parts	—	0124.9387
is the sine of G r H 70 d	+	9972.9858
the line G H 2061 parts	+	0313.9955

Now making the line G H 206 the Radius, that is, 2 inches and $\frac{6}{100}$ parts, and opening the sector to the width, try whether the naturall tangent of 70 d. the equinoctiall distance of of clock from the substile, set off from H upon the equinoctiall line, will fall within the plane ; if not, make this Radius, and consequently the houres greater or lesser till they justly fill the plane, which will follow in due proportion, because the equinoctiall line K H ♈, is a tangent line to the circle, drawn upon the Radius, or semidiameter H G. From this ground you may also finde the length of the Radius by the greatnesse of the plane, (as in the ninth Chapter) adde 364 and 2747 the naturall tangents of 5 and 11, the two extream houres together, so have you 3111 that is three times the radius, and 11 hundred parts, for the distance of those two houres, by which divide the radius (encreased for more exactnesse with as many ciphers as you will) the quotient will bee 321, or seeke the arithmeticall complement of the logarithme of 3111 in the chiliads, *vizt.* 0507.1000, and that shall give you the length of the radius 321, as afore. Then open the sector to the width of 5 and 11, (which two points you may assigne where you please upon the equator) take thereof 32 parts, which shall bee the true length of the radius desired. When you have fitted the radius for the two extream houres, all the rest may be put on by the tangents proper to them, but it will be first necessary to finde the length of the perpendicular stile, by help whereof to draw the equinoctiall line in the true place, therefore in the triangle H O P, right angled at P, *by the first case of R. P. triangles.*

As the sine of H P O	90 d 0′	10000.00
Is to the line H O	2061	0314.00
So is the cosine of H O P	3 58	9998.96
To the line O P	2056	10312.96

 Now

Now making 2056 *vizt.* 2 inches, and $\frac{56}{1000}$ parts, the le
of the perpendicular ſtile O P to be the radius, the ſubſtile
ſhall be a tangent line thereunto, and P H the diſtance of t
quator from P, is 069 parts, the naturall tangent of 3 d. 5
heighth of the pole above this plane, by which poi
draw the line before imagined, which, if you have not
will cut the horizontall line at 6 of clock, and make an a
with the horizon of 38 d. 18′, equall to the diſtance of th
ſtile from the meridian; upon this line (making H O, or
to bee the radius) you may by the former rule with a ſca
inches, or by the ſector, or by a line divided equall to H O (
the firſt Chapter) by help of the naturall tangents aforeſaid
on all the reſt of the houre diſtances that you deſire, for exa
in 11 of clock, *by the ſecond caſe of R. P. triangles.*

		Logar.
As the radius H G or H O		10000.00
Is to the line H O	2061	0314.00
So is H 11 the tang. of H G 11	70 d 0′	10438.93
To the line H 11	5662	10752.93

Which is 5 inches and 66 hundred parts for the diſtance of
of clock from the point H, and ſo of the reſt; or for brevit
ſake, take the logarithm of H O 0314.00 into a peece of pap
& ad it to each Log. tangent of 5 d. 10 d. 25 d. 40 d. &c. ſo ſh
you beget new logarithmes, which being found in the chiliad
ſhall yeeld abſolute numbers, that taken off the ſcale of inche
and ſet from the ſubſtile both wayes, will give the true diſtan
of each houre and part upon this equinoctiall line, agreeab
with the naturall tangents aforeſaid taken off the ſector. Havi
done with this equinoctiall, you muſt do the like with anothe
which may bee drawn above or beneath this without reſpect
to finde the place whereof, it will bee neceſſary firſt to know
the lenghth of the whole line from H the equinoctiall to th
center of the Diall in parts of the perpendicular ſtile P O, if yo
will work by the ſcale of inches, or in naturall tangents, if b
the ſector; wherefore *by the ſecond caſe of R. P. triangles.*

		Logar.
the radius P O		10000.00
the line P O	206	0314.07
is the tangent of P O H	3d 58′	8840.99
the line P H	014 —	9155.06
	Compl. char. 0.	
so is the tang. of P O M	86d 2′	11159.00
the line P center	2972	X1473.07

de the two lines of 014 and 2972 together, ſo have you the ole line 2986 from the equinoctiall to the center, in parts of radius P O, *vizt.* 29 inches, and $\frac{68}{100}$ parts, out of this line a- e what parts you pleaſe, (if you will draw the ſecond equi- ctiall line above the firſt, or adde them if you will draw it der) ſuppoſe 343 that is 3 inches and $\frac{43}{100}$ parts, which ſet from to L upon the ſubſtile, draw another equinoctiall by L, para- l to the former ; then will L O be a new radius for this equi- ctiall line, as H O was for the former, and is thus eaſily found *the fourth of the ſixt book of Euclide.*

		Logar. Ar. Compl.
the whole line H center	2986	8524.90
to the Radius H O in parts	206	0314.00
is L cent. (343 In. being abated)	2643	1422.10 *Ar. compl.*
the radius L O in parts	182	X0261.00

ving the length of L O one inch and $\frac{82}{100}$ parts, make that the dius, then ſhall M L 4 be a tangent line thereunto ; open the tor to the width of L O, (or divide a line, as in the firſt Chap-) and take off from either of them the ſame houre diſtances, ich ſet upon this equinoctiall line, as you did upon the for- r, you have two pricks for every houre (upon each equino- all line one) by which to draw the true houre lines, without ard to the center at all. Now may you draw a line from O O, at the length of each radius H O, and L O, which ſhall the true heighth of a triangular ſtile repreſenting the axis, be continued as farre as you will ; which you may alſo finde on each equinoctiall line for more certainty ſake, in this man- r ; *by the firſt caſe of R. P. triangles.*

As

		Logar.
As the sine of HKO or LMO	$86^{d}\ 2'$	9998.95
Is to the line {*HO* or *LO*}	$2\underline{06}$ / $1\underline{82}$	0314.00 / 0261.00
So is the sine of HOK or LOM	$90^{d}\ 0'$	10000.00
To the line {*HK* or *LM*}	$2\underline{066}$ / $1\underline{829}$	0315.05 / 0262.05

Set of $2\underline{066}$ inches from H to K, and $1\underline{829}$ inches from L (by help of a scale of inches) so have you fower pricks to the axis by.

The operation by naturall Tangents.

But if you will work by naturall Tangents only, you with some lesse labour attaine your desire in this manner: ving drawn the horizontall line and substile as afore, propor the length of P O the perpendicular stile, to what scantling will: let that be the radius, then is P H the naturall tange 3 d. 58', $\underline{069}$ parts of a radius, which take off the sector op to the width of P O, and set it from P to H; next let H O b radius, and set off the naturall tangent of 20 d. $\underline{364}$ from H wards for 5 of clock, and the naturall tangent of 70 d. from H downwards for 11 of clock; if these two houre d ces fit the plane to your liking, proceed, if not, make P O gr or lesser as you see cause, according to which the distance o from P, by which the equinoctiall line must bee drawn, and length of H O, and the width of all the houre lines do pro tionally vary. Or if you like it better, you may at first (by former rule) finde the length of P O proportionable to width of the two extream houres 5 and 11, which you prescribe at your pleasure. Having fitted the houres upon line, draw another; to performe which, let P O bee the r againe, then is P H the naturall tangent of 3 d. 58', $\underline{069}$ p

[..]d P center, the naturall tangent of 86 d. 2′, $14^{\underline{421}}$, adde them [to]gether, you have the whole line H center, $14^{\underline{490}}$ that is 14 [tim]es the radius, and $\frac{49}{100}$ parts, out of which subtract what num[be]r of parts you will, the rest is the distance from the second e[q]uinoctiall to the center, suppose $1^{\underline{58}}$ that is 1 radius and $\frac{58}{100}$ [pa]rts, which set from H to L, by the point L draw the line [..] L 4 paralell to the former equinoctiall, and there will remain [fr]om L to the center $12^{\underline{91}}$. Now seek the length of L O which [is] the radius for this line, as H O was for the former, let H O [th]erfore be given in some known parts $3^{\underline{21}}$ that is $\frac{32}{100}$ parts next [..]nd of the width of the two extream houres 5 and 11, *by the [fo]rmer fourth of the sixt booke of Euclid.*

		Logar.
[A]s the whole line H center	$14^{\underline{49}}$ +	1161.08
[I]s to the radius H O in parts	$3^{\underline{21}}$ —	0493.50
[S]o is the line L center	$12^{\underline{91}}$ +	1110.92
To the radius L O in parts	$\underline{286}$ —	9456.34
	Compl. char. 0.	

Now making L O the radius, open the sector to that width, [a]nd set on the naturall tangents of every houres distance upon [th]is equinoctiall line, as you did upon the former, so have you [t]wo pricks to draw each houre line by, as you had before ; the [ax]is or stile line K O M O is found as in the former work, which [m]ust crosse H O and L O at right angles, and being drawn, you [h]ave done. All this by help of a line of 12 inches divided into [1]0 parts, and $\frac{1}{10}$ part subdivided into 100 (as hath been former[l]y shewed) may be easily transferred from the paper into the [p]lane. Thus may you take your choyce, whether you will give [th]e width of either extream houre, and from thence argue the [le]ngth of the radius, and other things unknown ; or else give [t]he length of the perpendicular stile, and by that proportion [t]he rest ; or thirdly give the capacity of the plane, and thereby [c]ollect the length of the radius, &c. for all three wayes you may [e]asily obtain your desire.

And note, that if you will content your selfe with fewer houres, you may put the substile into the middle of the plane, and taking in but the houres of 4 and 9, you may make every houres

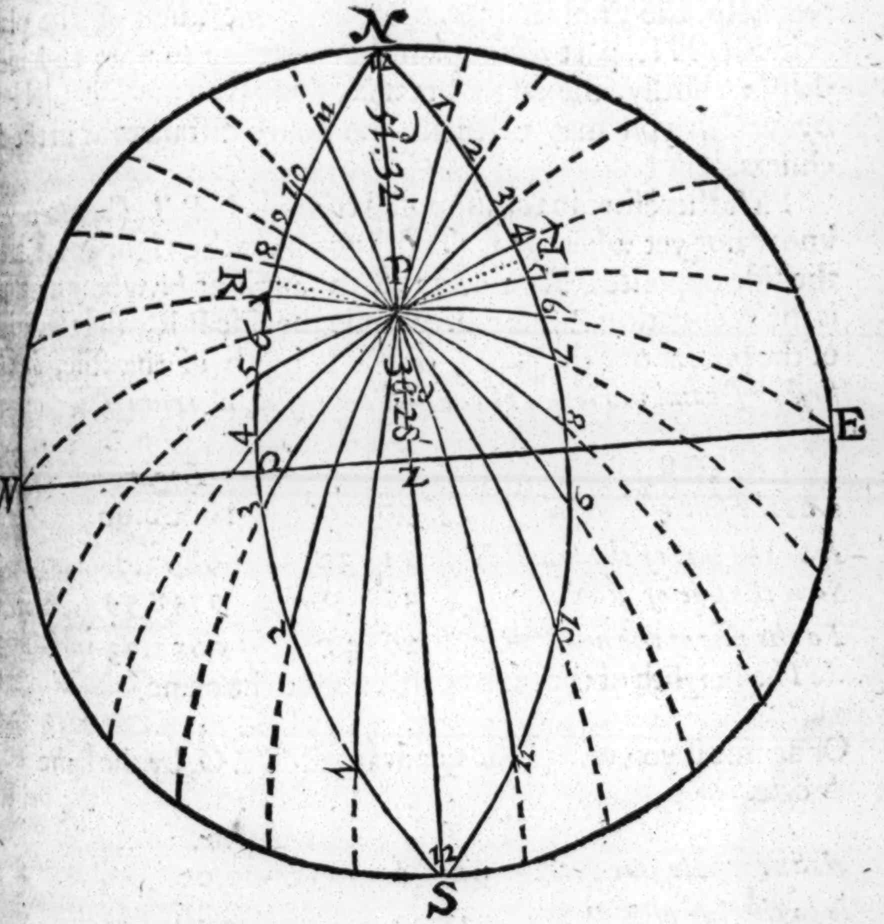
houres distance twice as great as it was; but if you be not co-
fined by the plane, neither are you limited in the width of
houre lines.

CHAP. XII.

*To draw the houre lines upon any direct plane, reclining or in-
ning East or West.*

Hitherto I have only spoken of such planes as a
either paralell or perpendicular to the horizo
all which, excepting the horizontall, lie in t
plane of some azimuth or other: The rest th
follow are reclining from the zenith, or incl
ning to the horizon, according to the respe
of the upper or nether faces of the planes. In these the base i
a line in the plane, paralell to the horizon, and alwayes situ
in some azimuth or other. So doth the base of the East an
West reclining plane lie in the meridian, or South and Nort
azimuth, and the poles thereof in the prime verticall; but th
plane it selfe in some circle of position, (as it is astrologically ta-
ken) which is a great circle of the Sphere, passing by the Nort
and South intersections of the meridian and horizon, and fallin
East or West from the zenith upon the prime verticall, as muc
as the poles of the plane are elevated, and depressed above an
under the horizon. And this kind of plane rightly conceived
and represented in the schem by N O S or N 9 S, is no othe
but an erect declining plane in any Country where the pole is
elevated the complement of ours: for if you consider th
Sphere, it is apparant that as all the azimuths representing the
decliners, do crosse the prime verticall in the zenith, and fall at
right angles upon the horizon, so do all the circles of positio
representing the reclining and inclining East or West planes
crosse the horizon in the North and South points of the meridi-
an, and fall at right angles upon the prime verticall. From
which analogy it commeth to passe, that making a Diall decli-
ning

ning 30 d. from the meridian, it shall bee the same that a recli-ning 30 d. from the zenith, and contrary, only changing the e-levation of the pole into the complement thereof, because the prime verticall in this case is supposed to be the horizon, above which the pole is alwayes elevated the complement of the heighth thereof above the horizon.



Data {Elevation of the pole 51^d 32′ N P
{Reclination E or W 35 0 Z 3, or Z 9

Quæsita {1 The heighth of the stile P R 26^d 41′
{2 The distance of subst. & merid. R N 45 52
{3 The angle between the meridians R P N 66 27

The

The Demonstration.

Before the making of the Diall, draw the schem by the rule of the fourth Chap. then find (as in all decliners) first the elevation of the pole above the plane, which is P R, part of the meridian of the plane, beeween the pole of the world and the plane: secondly, the distance thereof from the meridian of the plane, which is N R, part of the plane betwixt the substile and meridian: thirdly, the angle betwixt these two meridians N P R, by which you may calculate the houre distances as in the decliners.

First therefore in the supposed triangle N P R (because you know not yet where R shall fall) you have the right angle at R, the side opposite P N 51 d. 32′, & the angle at N, whose measure is the reclination Z O 35 d. to finde the side P R, the elevation of the pole above the plane, or the heighth of the stile, *by the first or second varieties of the first case of R. S. triangles.*

First,			*Logar.*
As the sine of P R N	90^d	0′	10000.00
Is to the sine of the side P N	51	32	9893.74
So is the sine of P N R	35	0	9758.59
To the sine of the side P R	26	41	9652.33

The heighth of the pole or stile above the plane.

Or againe if you will in the quadrantall N Z O, by the same case.

			Logar.
As the whole sine N Z	90^d	0′	10000.00
Is to the sine of N P	51	32	9893.74
So is the sine of Z O	35	0	9758.59
To the sine of P R	26	41	9652.33

Secondly, you may finde the side N R, which is the distance of the substile and meridian, *by the two varieties of the second, third, and fourth cases of R. S. triangles.*

Is the sine of P R N	90d 0'	10000.00
to the tangent of the base P N	51 32	10099.91
is the cosine of the angle P N R	35 0	9913.36
the tangent of the side N R	45 52	10013.37

The distance of the substile from the meridian.

irdly, the angle at P between the two meridians may bee found *by the two varieties of the* 11, 12, 13, 14, 15, *and* 16 *cases of R. S. triangles.*

		Logar.
s the sine of the side P N	51d 32'	9893.74
to the sine of the angle P R N	90 0	10000.00
is the sine of the side N R	45 52	9855.95
o the sine of the angle R P N	66 27	9962.21

The angle at P being *66* d. 27', must needs fall between 7 d 8 of clock, because 8 is *60* d. distant from the meridian, and is 75 d. distant, therefore now let fall a perpendicular from P R, somewhat neere the middle, between 7 and 8 of clock, hich will help to direct the fancy in calculating the houres.

Houres and parts from the substile.		Equinoctiall distances.	Logarithmes of tangents.	Houre arches on the plane	Differ.
8	4	6d.27'	8705.61	2d.54'	
	½	13.27	9047.49	6.22	3d.28'
9	3	21.27	9246.62	10. 0	3. 38
	½	28.57	9395.19	13.57	3. 57
10	2	36.27	9520.95	18.21	4. 24
	½	43.57	9636.41	23.25	5. 4
11	1	51.27	9750.95	29.24	5. 59
	½	58.57	9872.70	36.43	7. 19
12	12	66.27	10013.00	45.51	9. 8
	½	73.57	10193.41	57.21	11.30
1	11	81.27	10475.25	71.29	14. 8
	½	88.57	11399.22	87.40	16.11

Houres

Houres and parts from the substile.		Equinoctiall distances.	Logarithmes of tangents.	Houre arches on the plane.	Differ.
	½	1d. 3′	7905.45	0d. 28′	
7	5	8. 33	8829.42	3. 52	3d.24′
	½	16. 3	9110.28	7. 22	3. 30
6	6	23.33	9291.62	11. 4	3. 42
	½	31. 3	9481.94	15. 8	4. 4
5	7	38.33	9553.42	19.41	4. 33
	½	46. 3	9668.26	24.59	5. 18
4	8	58.33	9783.92	31.18	6. 19
	½	61. 3	9009.47	39. 4	7. 46
3	9	68.33	10058.05	48.49	9. 45
	½	76. 3	10257.68	61. 3	12.24
2	10	83.33	10599.05	75.50	14.49

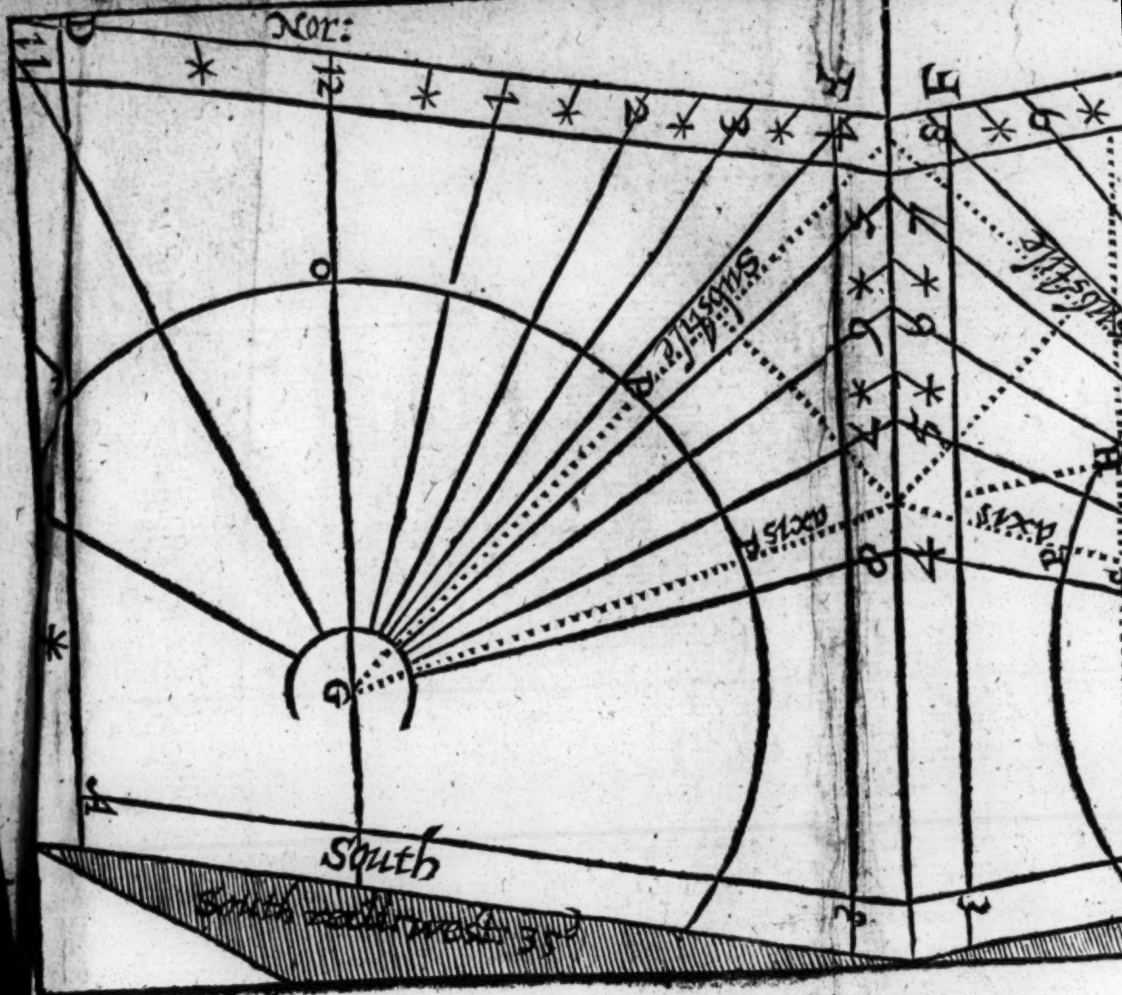
The Arithmeticall calculation.

Now make the table, (as heretofore directed) beginning w 8 of clock, and ending with 7½, as you see in the example; down by those houres all the equinoctiall distances from substile, *viz.* for 8 of clock 6 d. 27′, for 9 of clock 21 d.27′, so of the rest; then seek the true houre distances upon the pl *by the first variety of the fift case of R. S. triangles*; for in the angle R P 8,

		Logar.
As the sine of P R 8	90d 0′	10000.00
Js to the tangent of P R 8	6 27	9053.28
So is the sine of the side P R	26 41	9652.33
To the tangent of the side R 8	2 54	18705.61

This 2 d. 54′ is the true distance of 8 of clock from the s stile. And there is no other difference at all in calculating rest of the houres, but encreasing the angle at P according each houres equinoctiall distance from the substile.

Therefore now take into a Paper the Logar. sine of P R, elevation of the stile, which is 9652.33, and adde it continu



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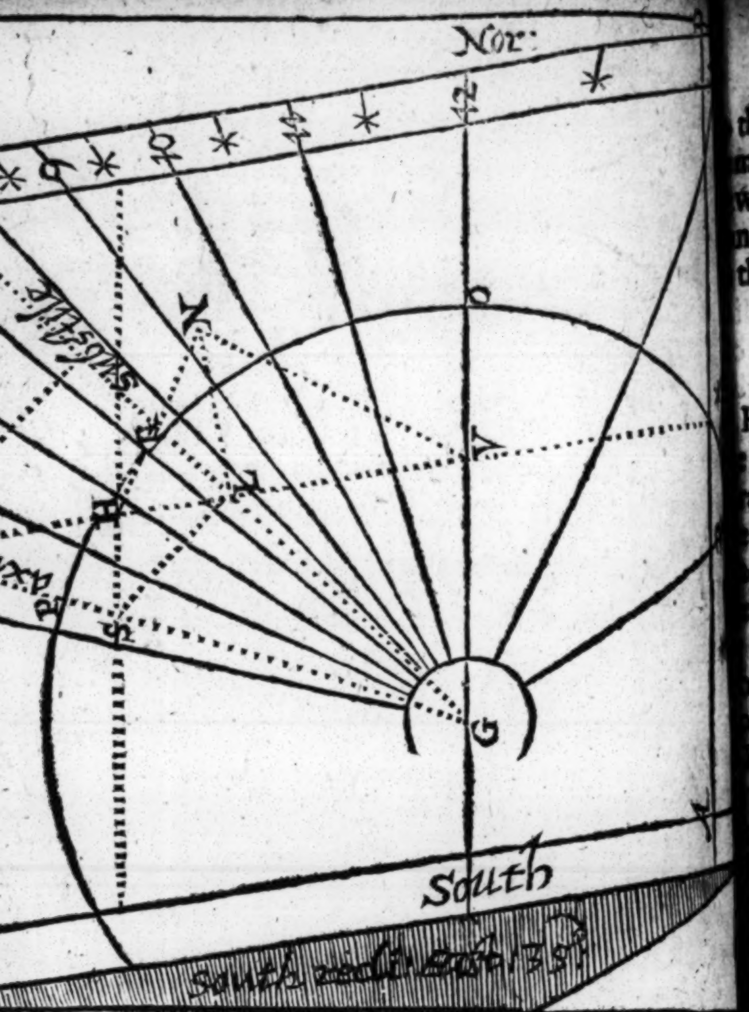

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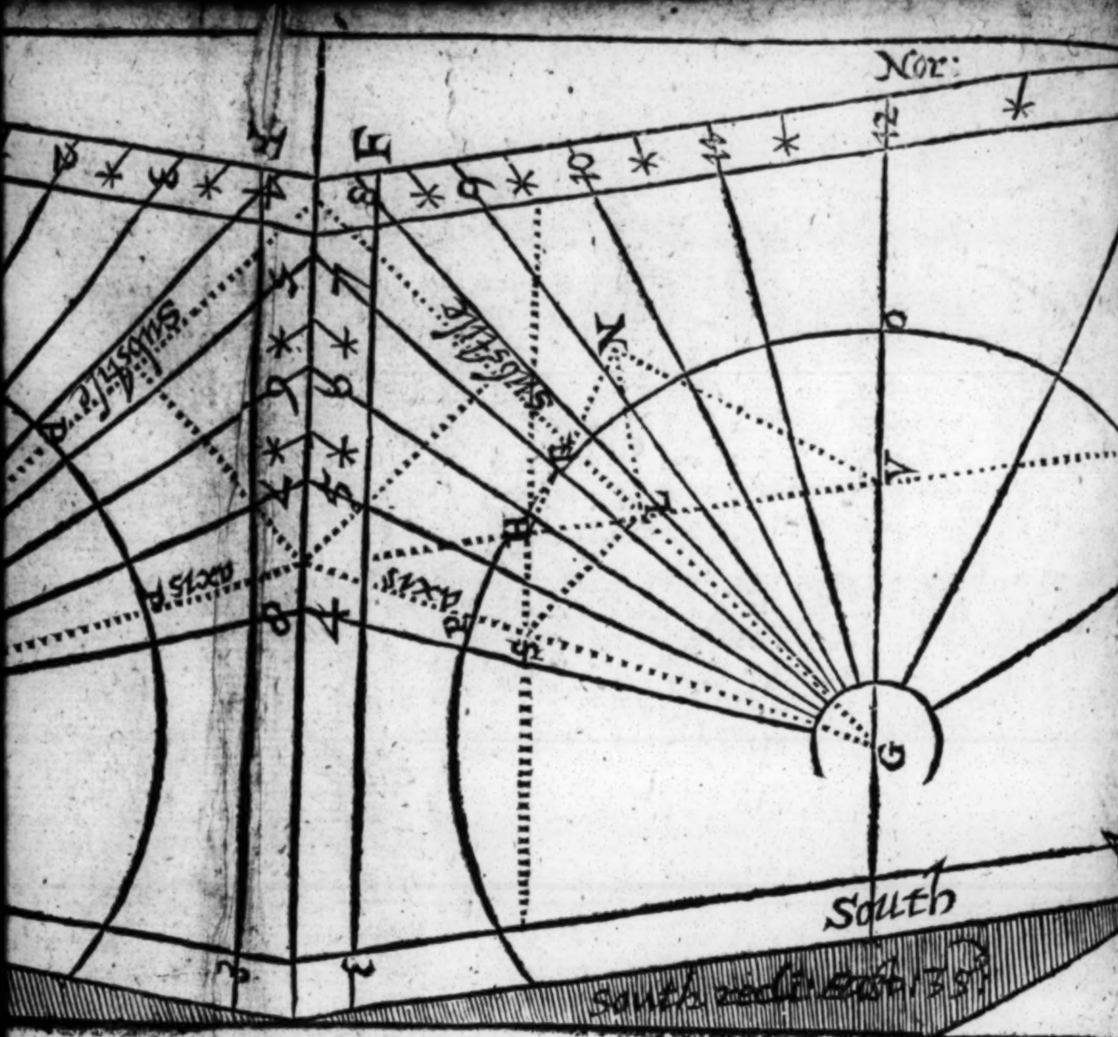
the Logar.tangents of every h
mplement, as they stand in th
w Log.tangents, the arches w
nces to be set from the substile
the example you see done.

The Geometric

Having calculated the houre d
Diall; Let A D be the base,
alell to N Z S the meridian li
plane reclining 35 d. from t
em, thorow any part of the pl
houres) draw a line paralell
G o 12, the 12 of clock hou
em, because the base A D is p
d. of the chord, and making
R O, representing the circle o
which this plane lieth: From
east reclining, and easterly i
tance of the substile and merid
; and draw the prickt line G
site of P R in the schem; G
h P N of the meridian in the s
he plane. From the point R
table doth direct you) set off
chord; *vizt.* for 8 of clock 2
9 of clock 10 d. 1′, and so of t
n the center G thorow those
e lines desired. Last of all
. 41′ being set from R to P,
xis of the stile, which must
t G P at the angle R G P p
G R, and let the point P
12 placed in the meridian,
, and the plane at E F eleva
ve you finished this Diall fo
unne riseth but a little befo



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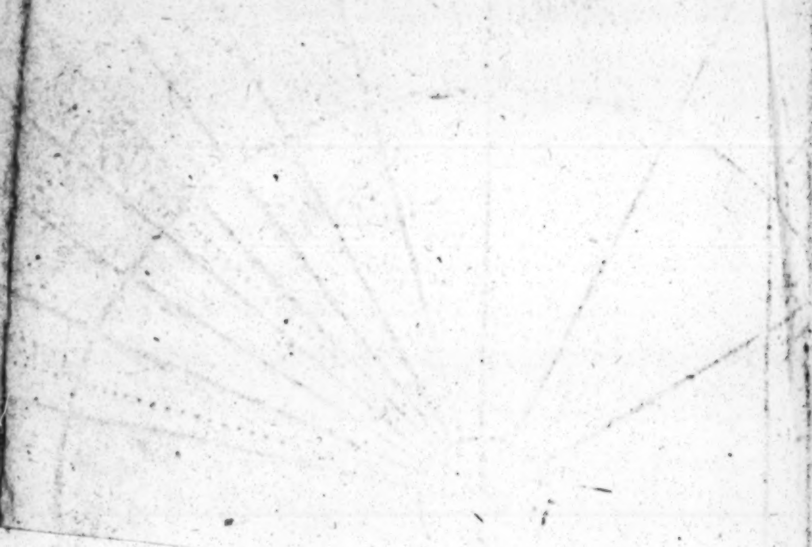
the Logar.tangents of every houres equinoctiall distance and
mplement, as they stand in the Table, so shall you produce
w Log.tangents, the arches whereof are the true houre di-
nces to be set from the substile both wayes upon the plane, as
the example you see done.

The Geometricall projection.

Having calculated the houre distances, you shall thus make
Diall; Let A D be the base, or horizontall line of the plane,
ralell to N Z S the meridian line of the schem; and A D E F
plane reclining 35 d. from the zenith, as doth S O N of the
em, thorow any part of the plane (but most convenient for
houres) draw a line paralell to the base A D, which shall
G o 12, the 12 of clock houre, representing N Z S of the
em, because the base A D is paralell to the meridian: Take
d. of the chord, and making G the center, draw the circle
R O, representing the circle of position N 3 S of the schem,
which this plane lieth: From the point O to R westerly in
east reclining, and easterly in the west reclining, set off the
tance of the substile and meridian, formerly found to be 45 d.
, and draw the prickt line G R, for the substile agreeable to
site of P R in the schem; G O of the Diall, representing the
h P N of the meridian in the schem; and O R the arch N R
the plane. From the point R of the substile both wayes (as
table doth direct you) set off the houre distances by help of
chord; *vizt.* for 8 of clock 2 d. 55′, for 7 of clock 3 d. 51′,
9 of clock 10 d. 1′, and so of the rest, and draw streight lines
n the center G thorow those points, which shall be the true
re lines desired. Last of all, the heighth of the stile P R
. 41′ being set from R to P, draw the streight line G P for
xis of the stile, which must give the shadow to the Diall:
t G P at the angle R G P perpendicularly over the substile
G R, and let the point P bee directed to the north pole,
12 placed in the meridian, the center G respecting the
, and the plane at E F elevated above the horizon 55 d.
ve you finished this Diall for use, only remember, because
Sunne riseth but a little before 4, and setteth a little after 8,



gar.tangents of every houres equinoctiall distance and
nt, as they stand in the Table, so shall you produce
angents, the arches whereof are the true houre di-
e set from the substile both wayes upon the plane, as
ple you see done.

The Geometricall projection.

calculated the houre distances, you shall thus make
Let A D be the base, or horizontall line of the plane,
N Z S the meridian line of the schem; and A D E F
reclining 35 d. from the zenith, as doth S O N of the
orow any part of the plane (but most convenient for
) draw a line paralell to the base A D, which shall
, the 12 of clock houre, representing N Z S of the
cause the base A D is paralell to the meridian: Take
e chord, and making G the center, draw the circle
epresenting the circle of position N 3 S of the schem,
this plane lieth: From the point O to R westerly in
clining, and easterly in the west reclining, set off the
of the substile and meridian, formerly found to be 45 d.
draw the prickt line G R, for the substile agreeable to
of P R in the schem; G O of the Diall, representing the
N of the meridian in the schem; and O R the arch N R
lane. From the point R of the substile both wayes (as
doth direct you) set off the houre distances by help of
ord; *vizt.* for 8 of clock 2 d. 55′, for 7 of clock 3 d. 51′,
of clock 10 d. 1′, and so of the rest, and draw streight lines
e center G thorow those points, which shall be the true
lines desired. Last of all, the heighth of the stile P R
being set from R to P, draw the streight line G P for
of the stile, which must give the shadow to the Diall:
G P at the angle R G P perpendicularly over the substile
R, and let the point P bee directed to the north pole,
placed in the meridian, the center G respecting the
and the plane at E F elevated above the horizon 55 d.
e you finished this Diall for use, only remember, because
nne riseth but a little before 4, and setteth a little after 8,

to leave out the houres of 3 and 9, and put on all the rest.

And thus have you (as before) at one work made foure D *vizt.* the east reclining, and west inclining as much, b them represented by the circle N 3 S, wherein there is n ference but the stile representing the north, and the pla zenith in the recliner, but the south pole and nadir in the i ner, and the number of the houres altered, as the turni the Dials will require. In like manner, these Dials do di agree with the other two, *vizt.* the west reclining 35 d the east inclining as much, as by plaine ocular inspectio peareth in the schem, where all the houre circles com from the pole do cut the planes of the two last sort of Di presented by the circle of position N 9 S, with the very angles that they did the other two represented by the ci position N 3 S; only the former cautions observed, of dire the stile, and writing the houres; which being placed on side the meridian, as the schem it selfe directeth, you ca erre. These things considered, that there is no essentiall d rence between these Dials, I make all foure to be but one, aforesayd.

CHAP. XIII.

To draw the houre lines upon any direct south reclining or i ning plane.

AS the base of east and west reclining or inc planes doth alwayes lie in the meridian place, or paralell thereto, and the poles prime verticall; so doth the base of south north reclining, or inclining planes, lie prime verticall, or azimuth of east and w and their poles consequently in the mer from whence (as all other planes do) they receive their mination. And now if you suppose the circle of p (which, Astrologically taken, is fixed in the intersection

meri

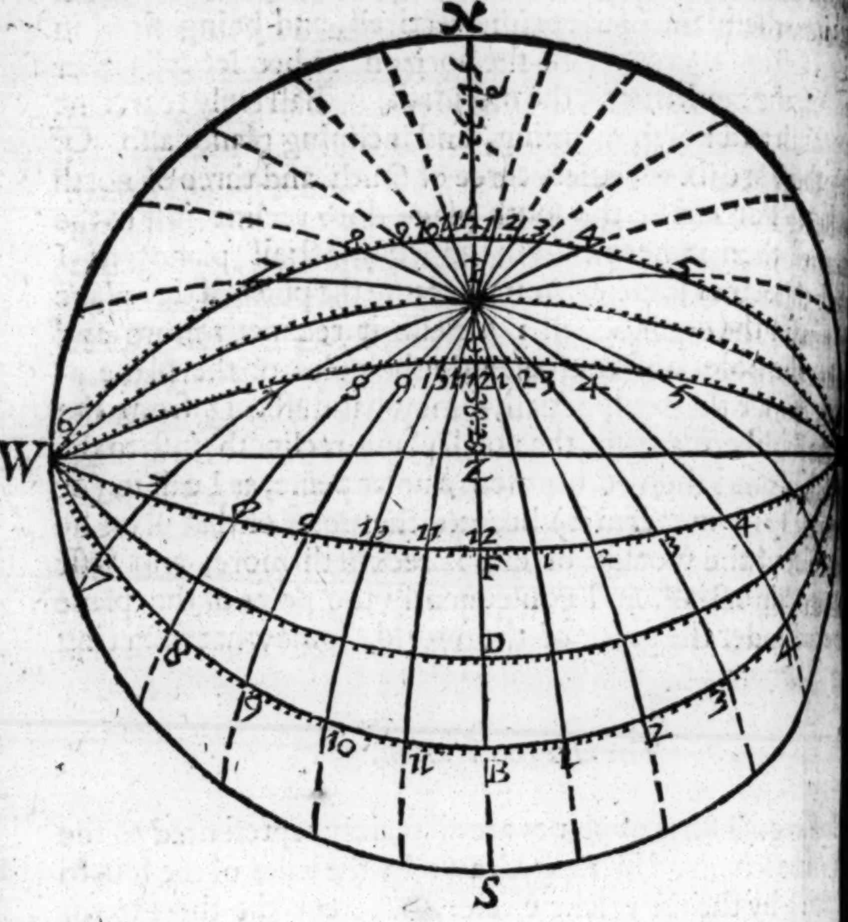
meridian and horizon to move about upon the horizon, till it comes into the plane of the prime verticall, and being fixed in the intersection thereof with the horizon, to bee let fall either way from the zenith upon the meridian, it shall truly represent all the south and north reclining, and inclining planes also. Of which there are six varieties, three of south, and three of north reclining. For either the south plane doth recline just to the pole, and then it becommeth an equinoctiall plane, as I call it, (or polar as some term it) because the poles of this plane do then lie in the equinoctiall: Or else it reclineth more and lesse than the pole, and consequently the poles of the plane above and under the equinoctiall, somewhat differing from the former: In like manner, the north plane reclineth just to the equinoctiall, and then becommeth a polar plane, as I call it, (or equinoctiall as some term it) because the poles of that plane lie in the poles of the world: or else it reclineth more, and lesse than the equinoctiall, and consequently the poles of the plane above and under the poles of the world, somewhat differing from the former.

The Demonstration.

These severall sorts of planes are all plainly represented to the eye, (in the schem adjoyning, drawn by the rules of the fourth Chapter:) by the six prickt circles, whereof the three to the northward of E Z W, are the three south recliners, and the three to the southward of E Z W, are the three north recliners; so called, because the poles of those planes have such respect to the north and south parts of heaven; and are elevated above the north and south points of the horizon N and S.

First therefore of the equinoctiall plane, and Diall to bee drawn thereon, represented by the circle E P W: wherein you may observe out of the schem it selfe, that this plane (lying in the 6 of clock houre circle, as the east and west do in the meridian) none of the other houre circles do cut the same; and therefore (as in the ninth Chapter) you may conclude, that the houre lines thereof have no center to meet in, but must bee parallell one to another, as in the east and west Dials they were.

 And



And becauſe this Diall is no other but the very horizontall o
right ſphere, where the equinoctiall is zenith, and the pole
the world in the horizon, therefore it is not capable of th
of clock houre (no more than the eaſt and weſt are of the 1
clock houre) which vaniſh upon the planes, unto which t
are paralell: and the 12 of clock houre is the middle line of
Diall, (becauſe the meridian cutteth the plane of 6 of clo
right angles) which the Sunne attaineth not, till he be perp
dicular to the plane. And this in my opinion, beſides the
ſpect of the poles, is reaſon enough to call it an equinoctiall
all, ſeeing it is the Diall proper to them that live under
equinoctiall, as the circle divided into 24 equall parts
there

herefore be called polar, because it is the Diall proper to them hat are seated under the pole.

The Arithmeticall operation.

This Diall is to bee made in all respects as the east and west vere, being indeed the very same with them, only changing he numbers of the houres. For seeing the 6 of clock houre n which this plane lieth, crosseth the 12 of clock houre at right ngles: in which the east and west plane lieth, the rest of the oure lines will have equall respect to them both: so that the ift houre from 6 of clock is equall to the fift houre from 12 of lock, the fourth to the fourth, and so of the rest. These analo-ies holding, you may resume the table of the ninth Chapter or your use here; only transposing the houres of 6 and 12. The quinoctiall distances and naturall tangents (which are the rue houre distances upon the plane) not varying at all.

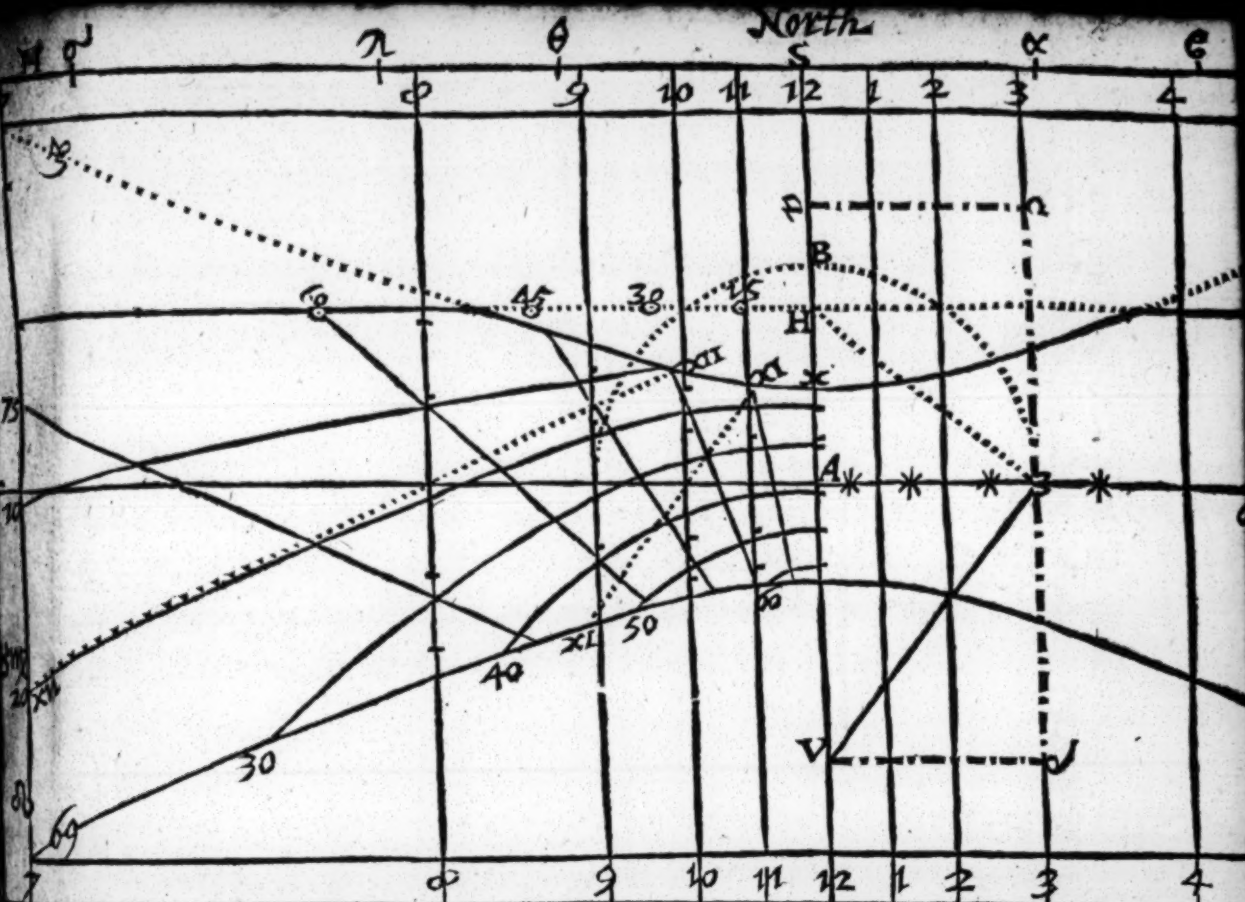
Houres and parts.		*Equinoctiall distances.*		*The houre distances upon the plane.*
		d	'	*tangent.*
12	0			
	1/2	7	30	132
11	1	15	0	268
	1/2	22	30	414
10	2	30	0	577
	1/2	37	30	767
9	3	45	0	1000
	1/2	52	30	1303
8	4	60	0	1732
	1/2	67	30	2414
7	5	75	0	3732
	1/2	82	30	7595
6	6	90	0	10000

The Geometricall projection.

Now then draw the tangent line H S K, paralell to th EZW; crosse it at right angles with N S A, the meridian which so intersecteth the plane in the schem. Make Z S o the radius to that tangent line, then is S α or S θ the na tangent of 30 d. S ϛ or S λ the naturall tangent of 45 d. S S ϑ the naturall tangent of 60 d. &c. as in the table app wherefore open the sector to the length of S A, (or divide equall thereto into 10 or 100 parts) and prick down th rall tangents as they stand in the table, from S both way α ϛ θ λ &c.) towards H and K, streight lines being dra row those pricks, paralell to the meridian line N Z S A houre lines desired. Now suppose this paper were the p which you should draw the Diall; it is manifest, that Z S of the schem or S A the radius, the plane is not cap the 7 or 5 of clock houres, the whole plane H K being bu times the radius: and these two houres distant seven tim radius and a halfe, as by the naturall tangents of each hour 12 doth appeare. Wherefore if you will put all the ho upon the plane that it is capable of, you must reduce the (which is the length of the stile) by the rules of th Chapter, to the greatnesse of the plane, and then proce foresayd: let that radius be A B, then shall ♈ A ♎ be a ta line to it; wherefore *by the second case of R. P. triangl.*

		Logar.	
As A ♎ the naturall tangent of 75 d.	3732	+ 0571.94	
Is to A ♎ (in known parts of an inch) the semidiameter of the plane	350	+ 0544.07	*by the C add*
So is A B the radius	1000	+ 0000.00	
To A B the length of the stile in the same parts	94	— 9972.13	

Comp. char. 0.



The line H S K *should be joyned to the former Scheme, as a Tangent lin*

Place this folio 142.

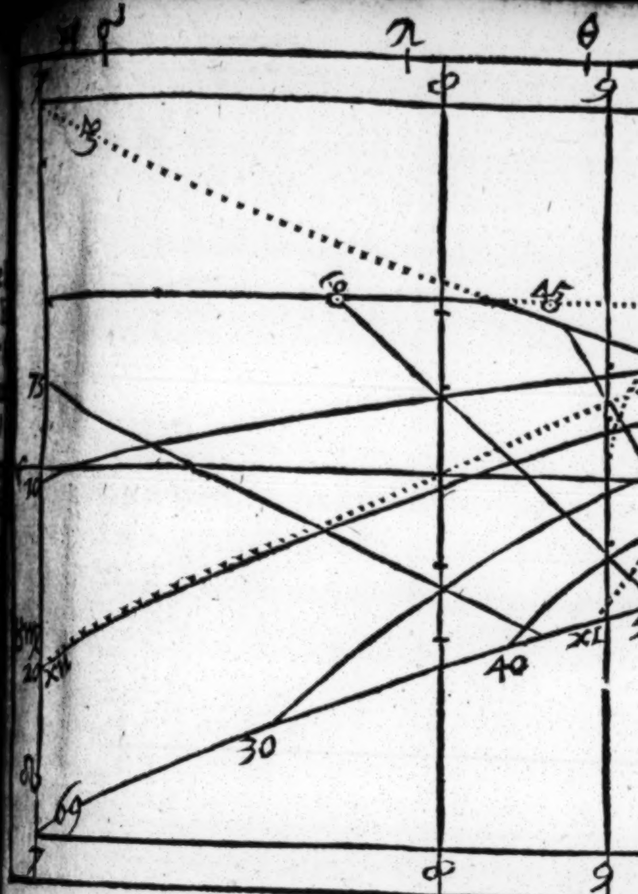
e Geometricall projection.

the tangent line H S K, paralell to the
right angles with N S A, the meridian
h the plane in the schem. Make Z S or
ngent line, then is S ♉ or S θ the na
or S ♌ the naturall tangent of 45 d. S
ent of 60 d. &c. as in the table appe
sector to the length of S A, (or divide
10 or 100 parts) and prick down the
stand in the table, from S both ways
ds H and K, streight lines being draw
paralell to the meridian line N Z S A
. Now suppose this paper were the plane
draw the Diall ; it is manifest, that m
or S A the radius, the plane is not capable
houres, the whole plane H K being but
nd these two houres distant seven times
s by the naturall tangents of each houre
. Wherefore if you will put all the hou
t it is capable of, you must reduce the ra
gth of the stile) by the rules of the
eatnesse of the plane, and then proceed
radius be A B, then shall ♈ A ♎ be a tang
re *by the second case of R. P. triangles.*

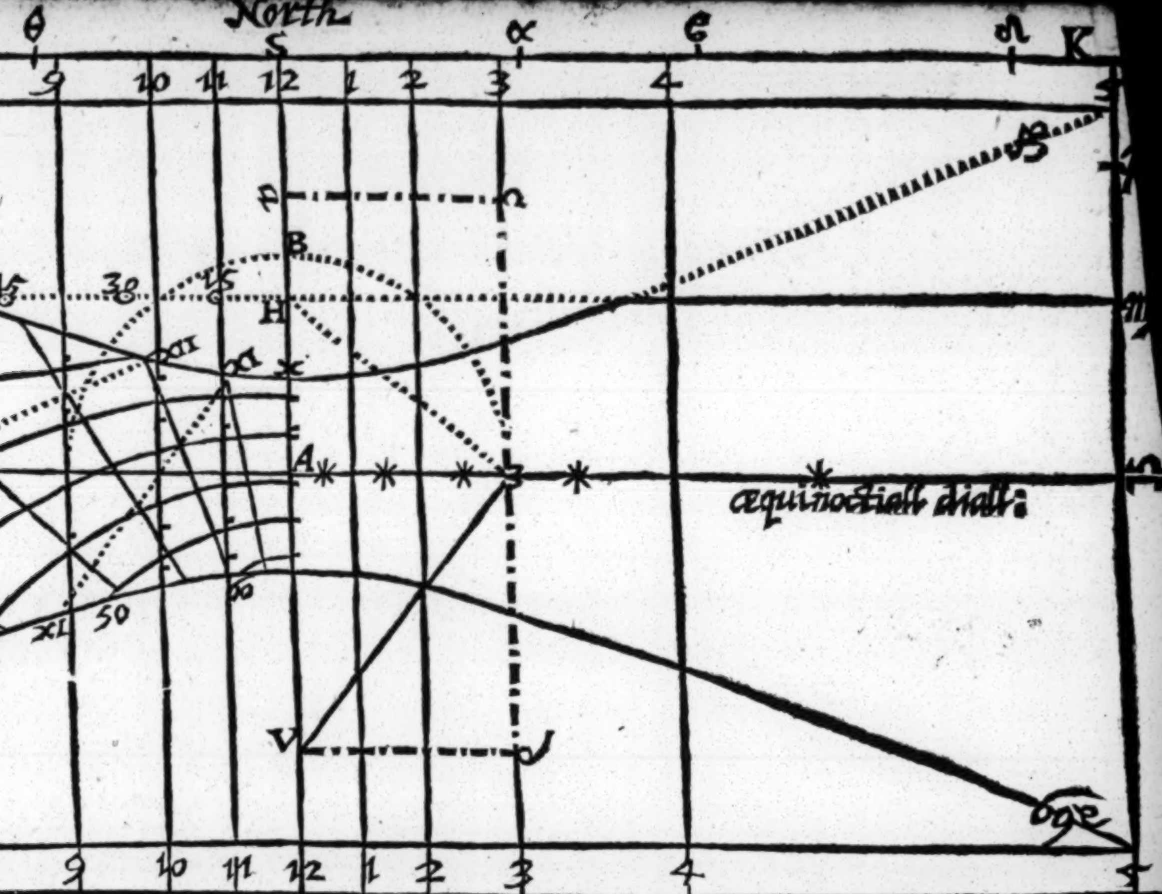
rall tan-		*Logar.*
	3732	+ 0571.94
n parts of *idiameter*		
	350	+ 0544.07
dius	1000	+ 0000.00
of the *parts*	94	— 9972.13

by the C *ads d*

Comp. char. 0.

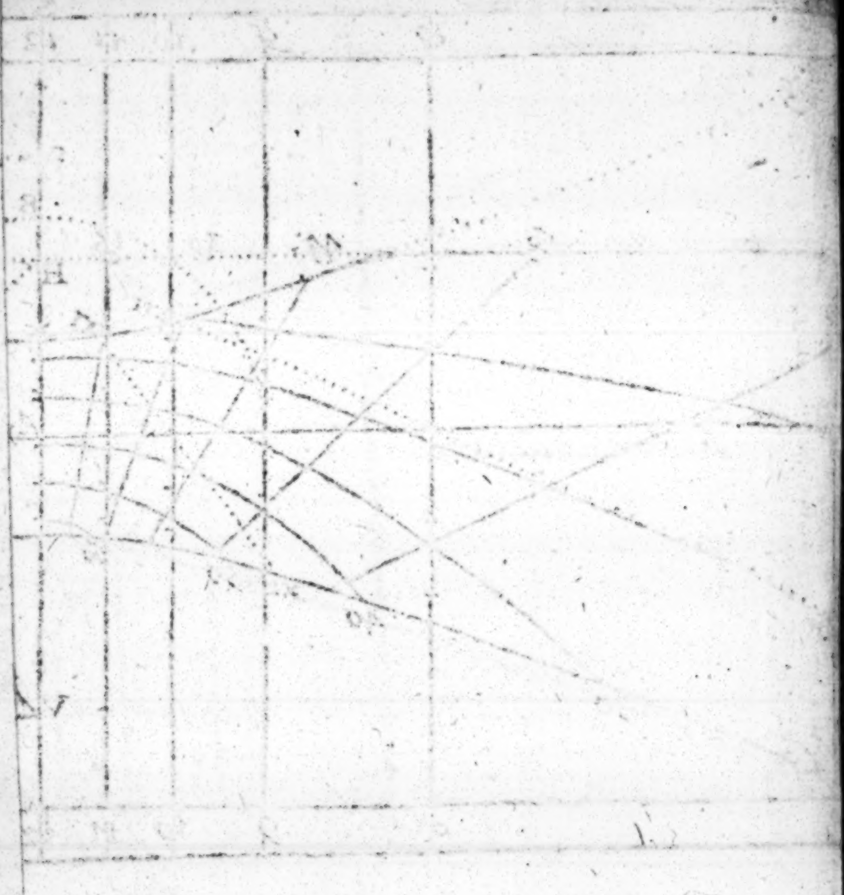


The line H S K *should be jo*



uld be joyned to the former Scheme, as a Tangent line at S.

Place this folio 142.



Or againe by the same case making ♎ A the radius, B A is a
[t]angent line to it ; and contrary, if the length of the stile bee
[fi]rst given.

		Logar.
[A]s ♎ A the radius	+	10000.00
to A B the tangent of 15 d.	+	9428.05
[So] is ♎ A in inches and parts 350	+	0544.07
[T]o A B in the same parts 94		9972.12 as afore.

Comp. char. 0.

Wherefore to fetch in the houres of 7 and 5 upon this plane, [y]ou must reduce the radius or stile from Z S or S A to the length [o]f A B 94 hundred parts of an inch, and then proceed to set on [th]e houres by naturall tangents as aforesayd. The stile may be [e]ither a streight pin the length of A 3 or A B, erected at right [a]ngles to the plane in the point A, or a long square of the [h]eighth of A 3 or A B, like a v c d, perpendicularly raysed over [th]e 12 of clock houre line, so have you done : Let S A 12 bee [p]laced in the meridian, and the whole plane at S raysed to the [h]eighth of the pole 51 d. 32′, then will the stile shew the [h]oures truly, and the Diall stand in its due position.

The second kinde South reclining lesse than the Pole.

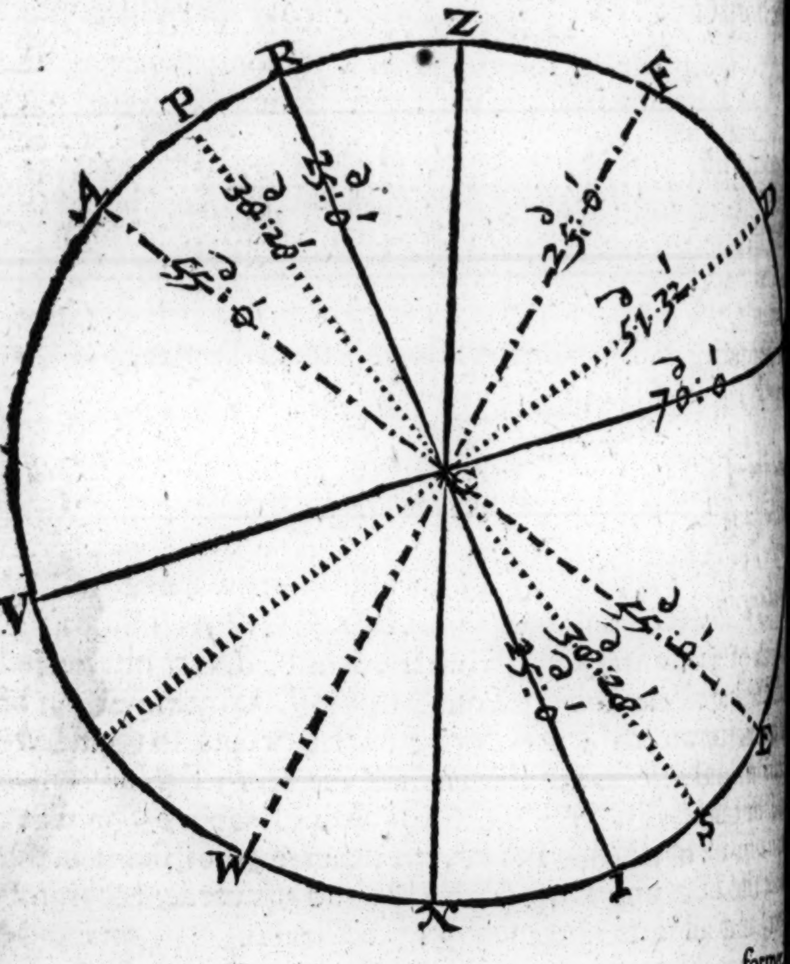
The Demonstration.

The other two prickt circles to the northward of E Z W [r]epresent the two reclining planes, *vizt.* E C W reclining 25 d. [a]nd E A W reclining 55 d. from the zenith, and are intersected [b]y the houre circles issuing from the pole P, as by inspection of [th]e schem appeareth ; therefore the Dials proper to them have [c]enters, and the poles are elevated above them ; the south pole [a]bove the plane E C W ; and the north pole above the plane [E] A W, which you may note, for directing the stiles : in the [fi]rst to looke downwards, in the second upwards, according [t]o the rules of the eighth Chapter abovesayd.

Wittekindus and others that follow him, have mistak heighth of the stile to this plane reclining 25 d. making 63 d. 28′ high, which should be but 13 d. 28′, and conse ly the Diall erroniously made by those directions. For whereof consider this Diagram; therein the limb repres the meridian, the situation of the whole plane in respect axis and poles of the world, is more aptly expressed then

Data. { Elevation of the pole P N 51 d. 32′.
Reclination Z C 25 d. 0′.

Quæsita. Heighth of the stile P C 13 d. 28′.



rmer, where the one halfe is alwayes supposed to be under the orizon. Let Z C N be a south plane erect direct ; Z represnting the zenith, and N the nadir of the place ; Z P, N S two rches of the meridian in them, P and S the north and south oles, distant from Z and N the angle Z C P, and N C S 38 d. 8′ the complement of the latitude : and let R C I be the plane eclining 25 d. from Z or N lesse than the pole. It is manifest, hat the south pole S is elevated above the plane C I the angle C S, and so much the north pole P is under the back part there- f R C ; therefore taking Z R 25 d. (equall to N I) out of Z P 8 d. 28′ (equall to N S) there remayneth R P 13 d. 28′ (equall o I S) the heighth of the south pole above the plane reclining 5 d. unto which heighth make the Diall in all respects, as you id the horizontall, and you shall have it fit for your plane.

The Arithmeticall calculation.

Returne now to the former schem, therein you have the tringle P C I, or rather taking the circle E D W for the equinoctiall in the quadrantall P D I, you have the whole side P D 0 d. and part thereof P C 13 d. 28′, and the side D I 15 d. of he equator, the measure of the angle P, the first houres distance rom the meridian, to finde the side C I upon the plane, *by the irst variety of the fift case of R. S. triangles. For,*

		Logar.
As the sine of P D	90d 00′	10000.00
is to the tangent of D I	15 00	9428.05
So is the sine of P C	13 28	9367.13
To the tangent of C I	3 34	18795.18

This arch of 3 d. 34′ is the distance both of 11 and 1 of clock ; nd this being all the variety, save increasing the angle at P, I eed not reiterate the work, but for imitation sake, have added his canon, and inserted the houres and parts, with their equinoctiall distances, into the Table following, as they follow in rder from 12 of clock. For the rest therefore of the houres ake out the Log. sine of 13 d. 28′ (the heighth of the stile) into paper, and adde it continually unto the Log. tangents and complements

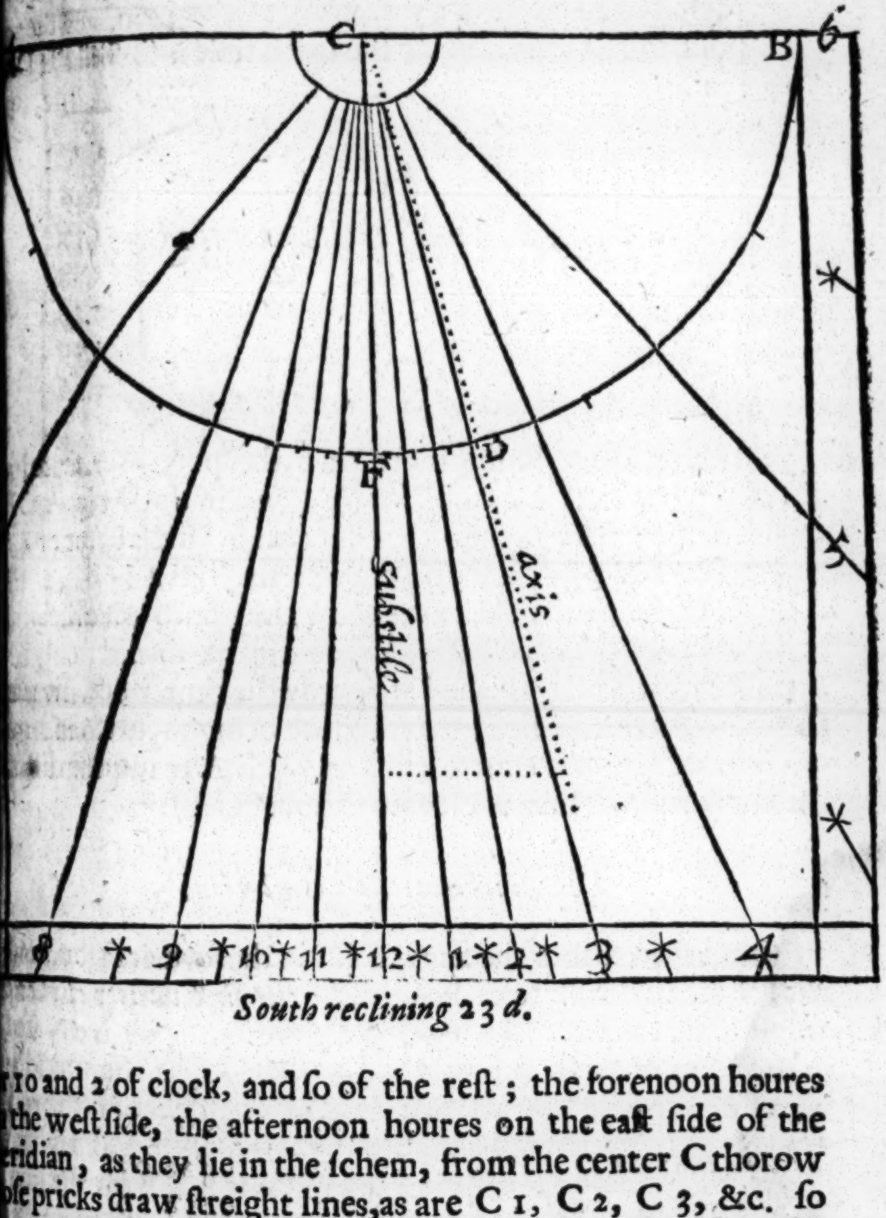
Houres and parts from the merid.		Equinoctiall distances.	Logarithmes of tangents.	Houre arches on the plane	Differ.
12	12	d '		d '	d '
	1/2	7.30	8486.56	1.45	
11	1	15. 0	8795.18	3.34	1.49
	1/2	22.30	8984.35	5.31	1.57
10	2	30. 0	9128.56	7.39	2. 8
	1/2	37.30	9252.11	10. 8	2.29
9	3	45. 0	9367.13	13. 7	2.59
	1/2	52.30	9482.14	16.53	3.46
8	4	60. 0	9605.69	21.58	5. 5
	1/2	67.30	9749.90	29.21	7.23
7	5	75. 0	9939 07	41. 0	11.39
	1/2	82.30	10247.70	60.31	19.31
6	6	90. 0	infinite.		

complements of every houres equinoctiall distance, as
stand in the table, so shall you produce other Logar. tang
which found in the canon, yeeld you arches for the true di
ces of the rest of the houres upon the plane.

The Geometricall projection.

These arches being thus found, to draw the Diall true, c
der the schem, wherein so oft as the plane falleth betw
and P, the zenith and the north pole, the south pole is eleva
in the rest the north; the substile in them all is the meri
because the prickt circles of the schem (representing the r
ning planes) do crosse the meridian thereof N Z S at righ
gles; wherefore draw the horizontall line A C B for the h
of 6, crosse it at right angles with C F for the houre of 12,
on the center C, and with the length of 60 d. of the chord
the circle A F B, representing the reclining plane of the
schem E C W; from F both wayes towards A and B
the houre distances of 3 d. 34′ for 11 and 1 of clock, of 7

North.



South reclining 23 d.

r 10 and 2 of clock, and so of the rest; the forenoon houres n the west side, the afternoon houres on the east side of the eridian, as they lie in the schem, from the center C thorow ose pricks draw streight lines, as are C 1, C 2, C 3, &c. so ve you done; by the same chord set on the heighth of the le 13 d. 28′ from F to D, and draw the prickt line C D, representing the axis of the world, which being erected at the me angle, over the substile C F 12, you have perfected the iall for a south reclining plane 25 d. as was required :. let the houre

houre of 12 be placed upon the meridian, and the whole at C raysed to an angle of 65 d. above the horizon, and th CD pointing downwards to the south pole ; so shall the stand in the due position to receive the shadow of the stile give the true houres desired.

The third kinde south reclining more than the pole.

The Demonstration.

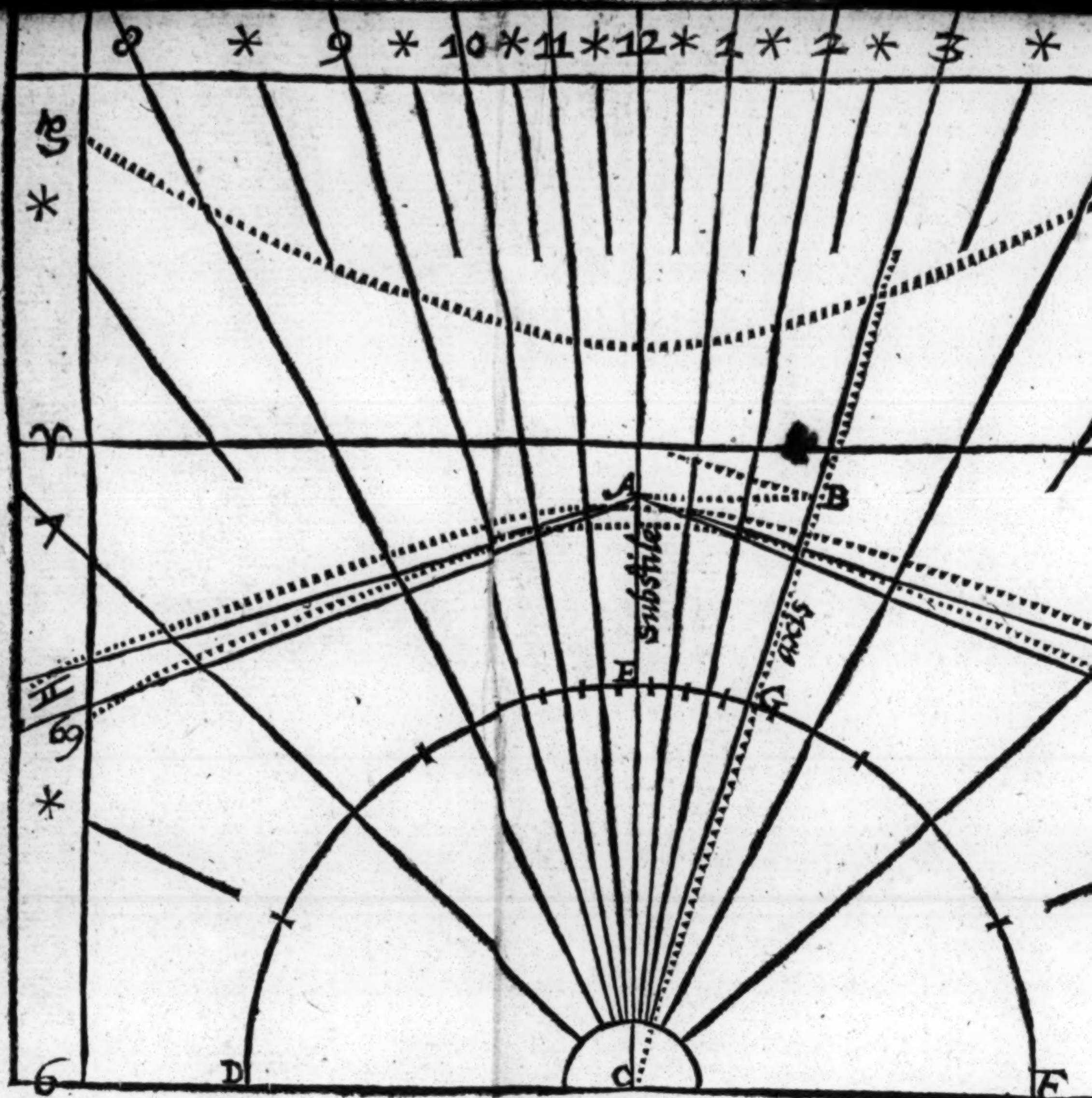
For the plane reclining more than the pole, represen the first schem by the circle E A W, and in the last by A take Z P the complement of the elevation 38 d. 28′ out o the reclination 55 d. and there will remayn P A 16 d. 3 heighth of the north pole above the plane ; unto which he make the Dyall in all respects, as you did the former, only membring (it being finished) to turne the center downw (or draw it so at the first) that the stile beingraysed to an of 16 d. 32′ upon the meridian line, C E A may point u the north pole, which is elevated above this plane.

The Arithmeticall calculation.

Instead therefore of the angle P C I in the former schem, w resolve the verticall to it P A 11, *by the first variety of the case of R. S. triangles. For,*

			Logar.
As the sine of P A 11	90^{d}	00′	10000.00
Is to the tangent of A P 11	15	0	9428.05
So is the sine of P A	16	32	9454.19
To the tangent of A 11	4	22	~~1~~8882.24

This arch of 4 d. 22′ is the true distance of the houres of 1 11 from the meridian line ; and so are all the rest of the ho calculated, only varying the angle at P.



South

South reclining 55 d.

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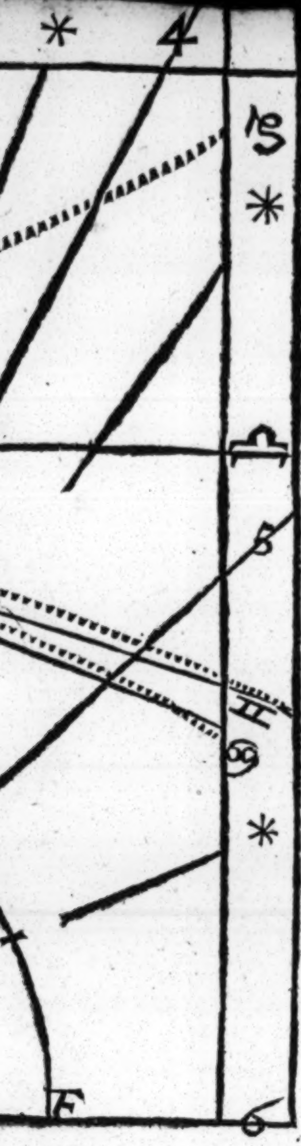
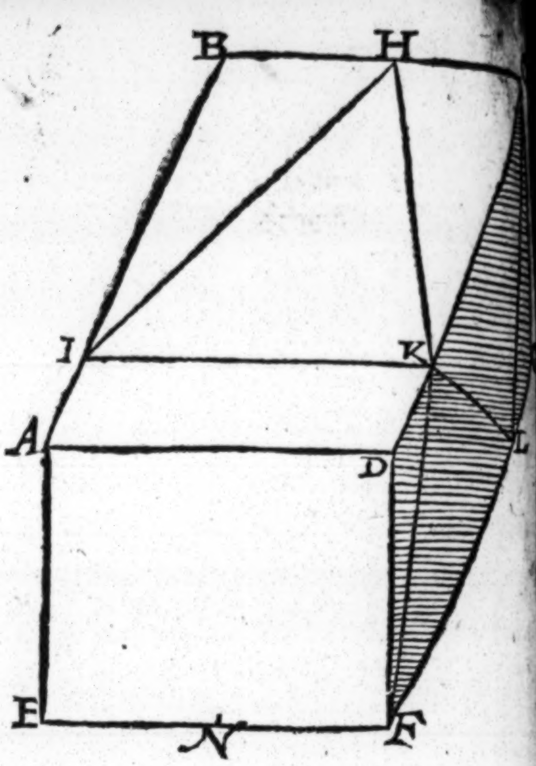
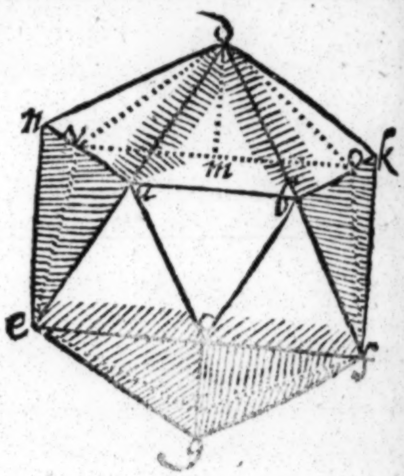






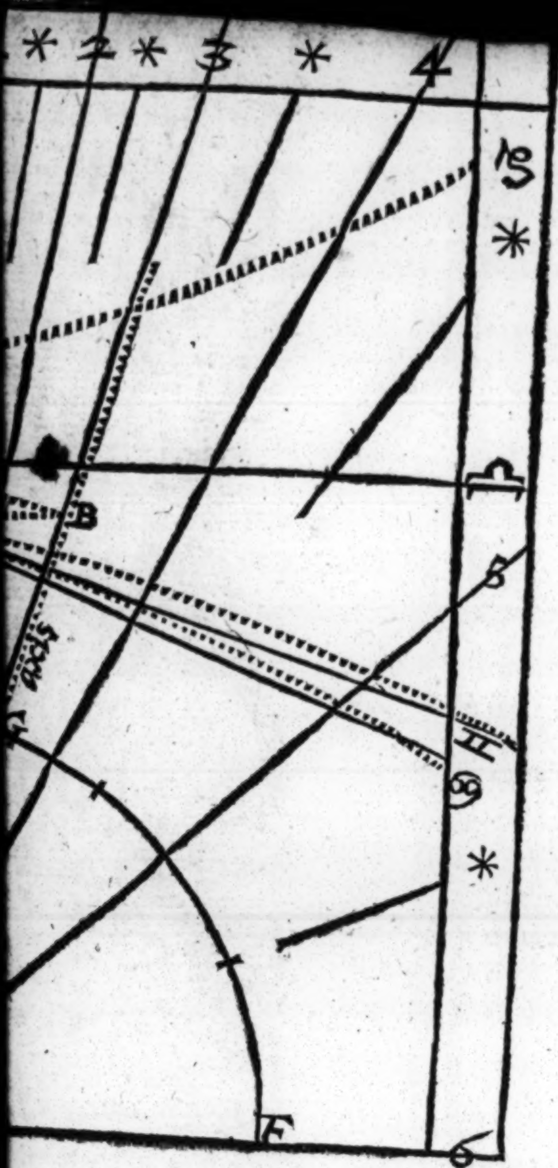
The Art

ow therefore ma
oyning unto the
distances, of 7 d.
e, &c. then trans
6 d. 32' the height
it continually un
houres equinocti
arith. tangents, t
es upon the plan
nd these three Dy
their opposites so
bers of the houre
e planes will dire

…res and …s from …e merid.		Equino-ctiall di-stances.
	0	d '
	½	7.3
1	1	15.
	1½	22.3
0	2	30.
	2½	37.3
9	3	45.
	3½	52.3
8	4	60.
	4½	67.3
7	5	75.
	5½	82.3
6	6	90.

Th… 9.

The houre arches
D C F be drawn
se it at right ang
N Z S do in the


2
3
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B
axis
G
F
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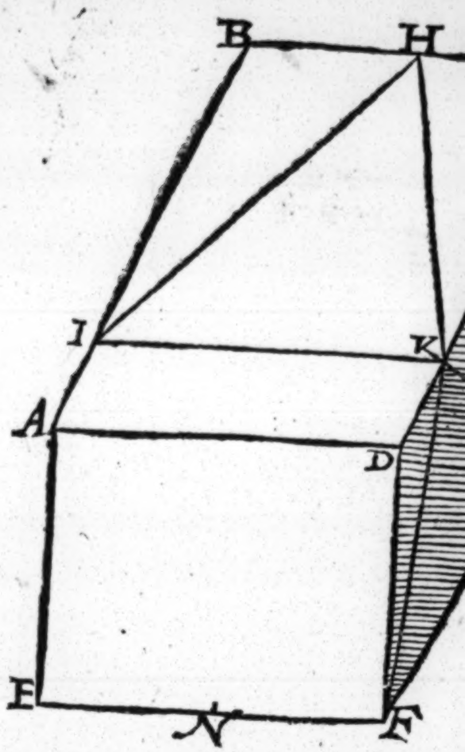
B
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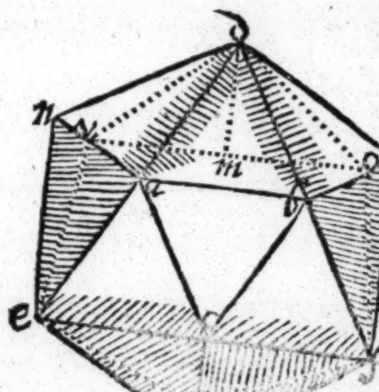

e
m

...therefore make the table as you see done in the exam-...ing unto the houres equidistant from 12, their equino-...stances, of 7 d. 30′ for halfe an houre, of 15 d. for one ...ee: then transcribe into a paper 9454.19 the Log. sine ...3, the heighth of the pole or stile above this plane, and ...continually unto the Log. tangent and complement of ...ures equinoctiall distance; so shall you produce new ...n. tangents, the arches whereof are the true houre di-...upon the plane, as appeares in the table.

...these three Dyals thus much south reclining, serve also ...ir opposites so much north inclining, changing but the ...rs of the houres, and respect of the stiles, as the nature ...planes will direct you.

...es and ... from ...erid.	Equino-ctiall di-stances.	Logarithmes of tangents.	Houre ar-ches on the plane.	Differ.
0	d ′		d ′	d ′
½	7.30	8573.62	2. 9	
1	15. 0	8882.24	4.22	2.13
½	22.30	9071.41	6.43	2.21
2	30. 0	9215.63	9.20	2.37
½	37.30	9339.17	12.19	2.59
3	45. 0	9454.19	15.53	3.34
½	52.30	9569.21	20.21	4.28
4	60. 0	9692.75	26.14	5.53
½	67.30	9836.96	34.29	8.15
5	75. 0	10026.13	46.43	12.14
½	82.30	10334.76	65.10	18.27
6	90. 0	infinite.		

The Geometricall projection.

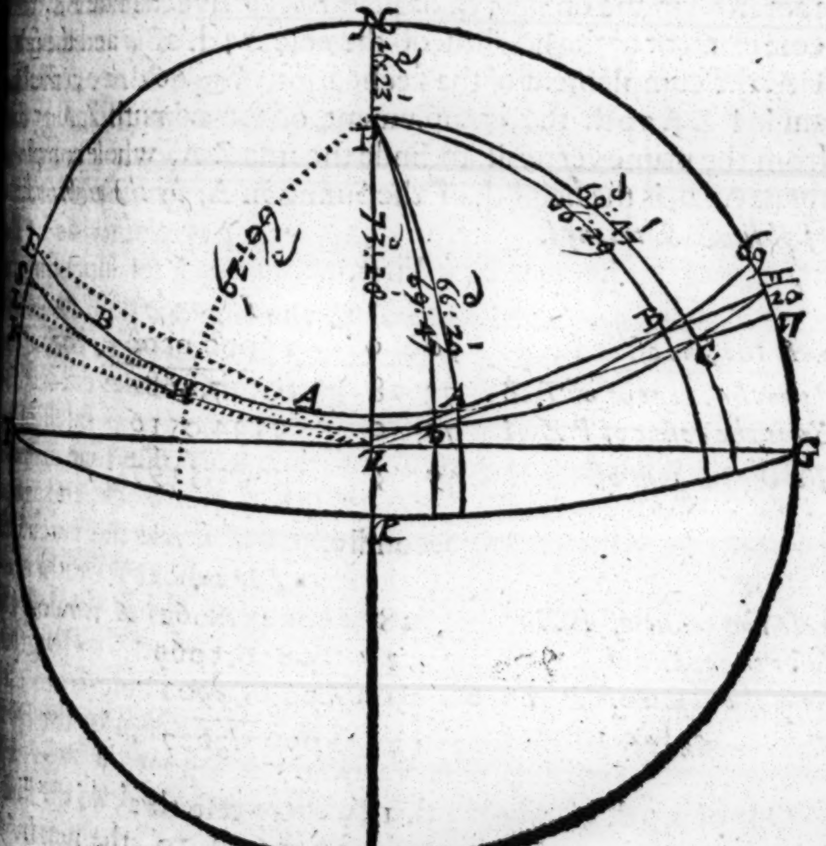
...he houre arches being calculated, look back to the schem; ...C F be drawn paralell to the horizon, for the houre of 6; ...e it at right angles with E C for the houre of 12, as E Z W ...N Z S do in the schem; upon the center C draw the circle

DEF

DEF (at the extent of 60 d. of the chord) represent[ing the de]clining plane in the schem E A W, from the point E se[t the] houre distances by help of the same chord both wayes to[ward] D and E, as you finde them in the table, and from E to [the] heighth of the stile, and thorow those pricks draw streig[ht lines] from C, which shall be the houre lines, and axis desired. [Let] C G B be erected perpendicularly over the meridian or [line] C E 12 at an angle of 16 d. 32′, and let the whole plane [be] be raysed above the horizon an angle of 35 d; then shall [the] C B point up to the north pole, and the Dyall bee fitted [to the] plane.

Now because this plane and Dyall falleth out conve[nient] for the purpose, I thought fit to speak somewhat of Cl[avius] conceipt of framing a Dyall, wherein the shadow of the [stile] shall go backwards and forwards, both forenoon and [after]noon: he writes at large of it, with the demonstration [there]of, in his book called *Horologiorum descriptio*; wherein he [ac]knowledgeth the retrogradation of the shadow upon the [Dy]all of *Achaz* to bee most miraculous, notwithstanding [that] so the plane may bee contrived, that at some time of [the] yeere the shadow of the stile shall performe the like in ord[ina]ry course of nature. The reason thereof is plaine, as by [the] Globe or this schem adjoyning may appeare: for supposing [the] Globe to be set to 16 d. 32′, the heighth of the pole above [the] plane; and the Sunne to bee in the beginning of ♊, being [the] quarter of altitude set in the due place, unto the seventeen[th a]zimuth from east northerly, and you shall see the paralell of [♊] wherein the Sunne is supposed to bee to crosse that azi[muth] twice before noon, once a quarter before 7 of clock, and ag[aine] about 11. Also the tropick of *Cancer* to crosse the twen[tieth] azimuth, once at 7 of clock 10′, and againe about 10 and a q[uar]ter, between which two intersections of either paralell [you] may observe the shadow of the stile apparantly to length[en] and shorten according to the distance of the Sunne from e[ach] of them; sometimes growing neerer the equator of the D[yall] from the intersection of A ♋ to the touch point of A ♊, [and] sometimes further off, from the touch point of A ♊ to the inter[]section of A ♋ againe. The like will be in the afternoone, [...]

the same times respectively, as the prickt lines in the Dy-
ssing the azimuths of A ♊ and A ♋ do delineat the same;
this will continue more or lesse to bee seene all the time that
Sunne spendeth between the zenith of the plane, and the
pick of *Cancer*, which will bee from the end of Aprill till
wards the end of Iuly following. And note, that fitting the
ne for this purpose, the like may bee done at all times of the
re, but best neere unto the Tropicks. The proper index to
w this conceipt, is a straight pin perpendicular to the plane,
the prickt line A B in the Dyall, but in a triangular stile
A B, the *nodus* or notch cut into it at B shall performe the
me, except you will cut the stile so short, that the end thereof
y serve. To make this more plaine, in the diagram adjoyn-
let FNG be the horizon, Z P N the meridian, therein P
north pole, elevated 16d. 32′ above the horizon at N, Z the



zenith, F E G the equator, E A B ♋ the Tropick of ♋, S H the paralell of ♊, Z A B the twentieth azimuth from the verticall F Z G, crossing the Tropick of ♋ twice in the noon at A and B, and at the like times and places in the noon, Z D C the seventeenth azimuth, crossing the para ♊ twice in the forenoon at D and C, and at the like time places in the afternoon.

Now I would know the heighth of the Sunne and hour the day in each place, where the Sunne crosseth the paralels ♋ and ♊, as also where it toucheth the same, to the end I observe without much attending, this conceipt of *Clavius* the Dyall.

From the pole at P draw foure meridians, passing by the double intersection of each paralell and azimuth in the points A B C D, and falling upon the equinoctiall at right angles; therefore in the oblique triangle P A Z I have the side P Z, the complement of the heighth of the pole 73 d. 28′, and the side P A, the complement of the declination of ♋ 66 d. 29′, and the angle P Z A 70 d. the complement of the azimuth Z A from the prime verticall, to finde the side Z A, whose complement A 20, is the heighth of the Sunne in A, *by the eighth of oblique S. triangles.*

First,

			Logar.
As the sine of	90 d	0′	10000.0000
Is to the tangent of P Z	73	28	10527.4681
So is the cosine of P Z A	70	0	9534.0516
To the tangent of	49	3	10061.5197

Secondly,

			Logar.	
As the cosine of P Z	73 d	28′	0545.8061	*Arith. com*
Is to the cosine of	49	3	9816.5065	
So is the cosine of P A	65	29	9600.9901	
To the cosine of	23	13	19963.3027	

Out of 49 d. 3′ take 23 d. 13′, there resteth 25 d. 50′ Z A, the complement whereof A 20 is 64 d. 10′, the heigh

Sunne in A, and added to 49 d. 3′ giveth 72 d. 16′ for the complement whereof B 20 is 17 d. 44′ the heighth of the Sunne in B. Now by two sides and an angle opposite to one of them, you may finde the angle at P opposite to the other, in each triangle Z P A and Z P B, *by the third case of Ob. S.* angles, the measures whereof upon the equator F æ G are the hours desired.

			Logar.	
the sine of P A	66d	29′	0037.6571	*Ar. compl.*
to the sine of P Z A	70	0	9972.9858	
so the sine of Z A	25	50	9639.2422	
to the sine of Z P A	26	31	19649.8851	

26 d. 31′ converted into time, gives 1 houre, 46 minutes for the houre of the Sunne in A, before or after noon.

			Logar.	
As the sine of P B	66d	29′	0037.6571	*Ar. compl.*
to the sine of P Z B	70	0	9972.9858	
so is the sine of Z B	72	16	9978.8579	
to the sine of Z P B	77	27	19989.5008	

77 d. 27′ converted into time, gives 5 houres, 10 minutes next hand, before or after noon, when the Sunne in B crosseth the azimuth of 20 d. from the prime verticall, and the variation of the shadow to bee performed in 3 houres and 24 minutes.

Lastly, let the azimuth Z H L be drawn to touch the paralell is in H, and let the meridian P H passe by the touch point thereof, so have you the triangle P H Z right angled at H, whose Z H shall give the complement of the heighth of the Sunne, the angle Z P H the houre of the day, when the Sunne in greatest obliquity from the azimuth Z L, which formerly crossed in B, commeth back again to crosse the same in A, shortning the shadow from B to H, and lengthning the same from H to A, *by the first of the third case of R. S. triangles*: and *the first of the fifteenth case of R. S. triangles.*

		Logar.
As the cosine of P H	66^d 29′	9600.9901
Is to the sine of P H Z	90 0	10000.0000
So is the cosine of Z P	73 28	9454.1938
To the cosine of Z H	44 30	9853.2037

Therefore H L 45 d. 30′ the heighth of the Sunne.

		Logar.
As the sine of P Z	73^d 28′	9981.6620
Is to the sine of P H Z	90 0	10000.0000
So is the sine of Z H	44 30	9845.6618
To the sine of Z P H	46 59	9863,9998

46 d. 59′ converted into time, giveth 3 houres, 8 mi[nutes] before or after noon, when the Sunne in his retro[grade] motion from H, lengthneth the shadow againe.

And, *by the second of the fifteenth case of R. S. triangles*, w[e] may finde the angle P Z H to be 73 d. 2′, therefore the a[zimuth] Z H L touching the paralell of ♋ is 16 d. 58′ from the [prime] verticall F Z G, neere the same with Z D C, 17 d, crossing [the] paralell of ♊ in D and C.

Thus may you also finde for the paralell of ♊.

The heighth of the Sunne { in C 15^d 20′. / in D 75 32.

			ho.	′
The houre of the day	in C	before noon	7	17½
		after noon	5	17½
	in D	before noon	0	59
		after noon	0	59

The heighth of the Sunne in H 55 d. 26′.

		ho.	′
The houre of the day in H	before noon	9	35
	after noon	2	25

And the variation of the shadow performed in 4 ho. 18′.

Now if I had drawn the azimuths of Z A B and Z D C [to] the intersection of each paralell with the horizon, as is Z E [for] ♋, and Z S for ♊, the retrogradation would have been

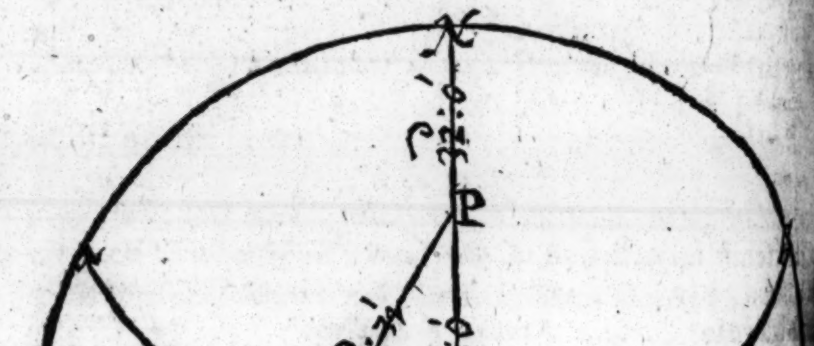
are apparant, conteyned between E L for ♋, and S R for ♊; and the times would have differed accordingly, but then the double interſection of the paralell and azimuth would not have been ſo manifeſt, ſeeing one of them hapneth upon the horizon, where the ſhadow vaniſheth ; and note, that the larger the plane is, the more apparant will the retrogradation be.

Some Divines writing upon this miracle, have confined the Dyall of *Achaz* to the equinoctiall plane only, which might be any other as well, and interpret the degrees ſpoken of by the Prophet, to be halfe houres, ſo that 10 d. conteyned 5 houres ; as well they might have made the degrees quarters of houres, and then the ten degrees had been but two houres and a halfe, which is very neere the truth in the matter of time. But ſeeing the Scripture taken in the literall ſenſe, doth ſufficiently manifeſt this wonderfull miracle, I ſee no reaſon to interpret degrees contrary to the uſuall acception of Aſtronomers, and grounds of Art, at the leaſt they could not be meant of halfe houres, becauſe *Hezekiah* had liberty to chuſe whether the ſhadow ſhould go forward ten degrees, or back as much ; but forward it could not go in the latitude of *Ieruſalem*, which is 32 d. becauſe the ſemidiurnall arch of the Sunne in ♑ is but 4 ho. 57′, and in ♋ but 7 ho. 3′, which muſt have been (accompting halfe an houre for a degree) 10 ho. at the leaſt.

My opinion is therefore, that the Dyall was a ſouth Dyall, drawn upon a ſouth erect plane or wall, moſt conſpicuous to every mans view ; that the degrees are literally meant, the degrees of altitude of the Sunne, commonly called almicanters ; that the time of the yeere was neere Chriſtmas, when the Sunne was in the winter tropick of ♑, in which ſigne the ſhadow deſcendeth ſloweſt ; that it was in the afternoon, becauſe the Sunne returned ten degrees which it had gone down ; that the Sunne returned not back at once, but in the ſame time that it had deſcended, to the end that moſt part of the world might take notice of the miracle, as the Scripture teſtifieth the Babylonians did ; and that the Sunne was neere two houres and a halfe returning to the meridian again, from whence it had formerly gone down ; and that the miracle was ſhewed about halfe an houre after two, as may be proved by the diagram fol-

lowing:

lowing: Therein NEMW the horizon, NPZM the meri-
an, Eæ W the equator, a t b and f c d the two tropicks, q e
o n two almicanters, P S a meridian, and Z S an azimuth
ſing by the place of the Sunne in S. The heighth of the p
Ieruſalem is P N 32 d, therefore the heighth of the eq
æ M 58 d. ſubtract the declination æ c 23 d. 40′, (about
time neere the middle obliquity) ſo have you the meridian
titude of the Sunne in ♑ c M 34 d. 20′, abate 10 degrees of
heighth, then was the Sun at the time of the miracle at S 2
20′ above the horizon, the complement whereof S Z is 65 d.
thus have you an oblique triangle P Z S, whoſe 3 ſides are gi
to finde the angle at the pole, *by the first caſe of O. S. triang*
ſhewing the time that the Sunne hath ſpent between the mo



[...]on at C, and going down of 10 degrees at S, which by this [exa]mple was 2 ho. 26′, and consequently the whole day length [...]ed 4 ho, 52′, which made the shortest day of the yeere equall with the longest.

ZS	65^{d}	40′		
SP	113	40		
ZP	58	0		
	237	20	*Logar.*	
the ½	118	40	0056.7898	*Ar. compl.*
	53	0	0097.6514	
	5	0	8940.2960	
	60	40	9940.4091	
	Totall		19035.1463	

The halfe whereof 9517.5731 *is the Logar. tangent of* 18 *d.* 14′ *halfe the angle at P, therefore the double* 36 *d.* 28′ *is the whole angle, which converted into time, giveth* 2 *ho.* 26′.

Yet lest this conceipt of *Clavius*, which hee also receiveth from *Nonius*, should seeme any thing at all to extenuate the wonderfull power of that miraculous signe, let the difference between them be considered; for in the Dyall of *Achaz* the Sunne it selfe was removed back in the heavens, and therefore the shadow as an effect thereof, which in the paralell motion of the Sunne from east to west was shortned in the afternoon, contrary to the course of nature; but in this conceipt, the shadow continually shortneth in the forenoon, and lengthneth continually in the afternoon; and the Sunne proceedeth continually from east to west, so that all the variety of the shadow is between north and south, quite contrary to the motion of the former. I therefore embrace the conceipt, but wish the comparison had been forborn, since they agree not at all together.

CHAP. XIV.

*To draw the houre lines upon any direct north reclining or in-
ning plane.*

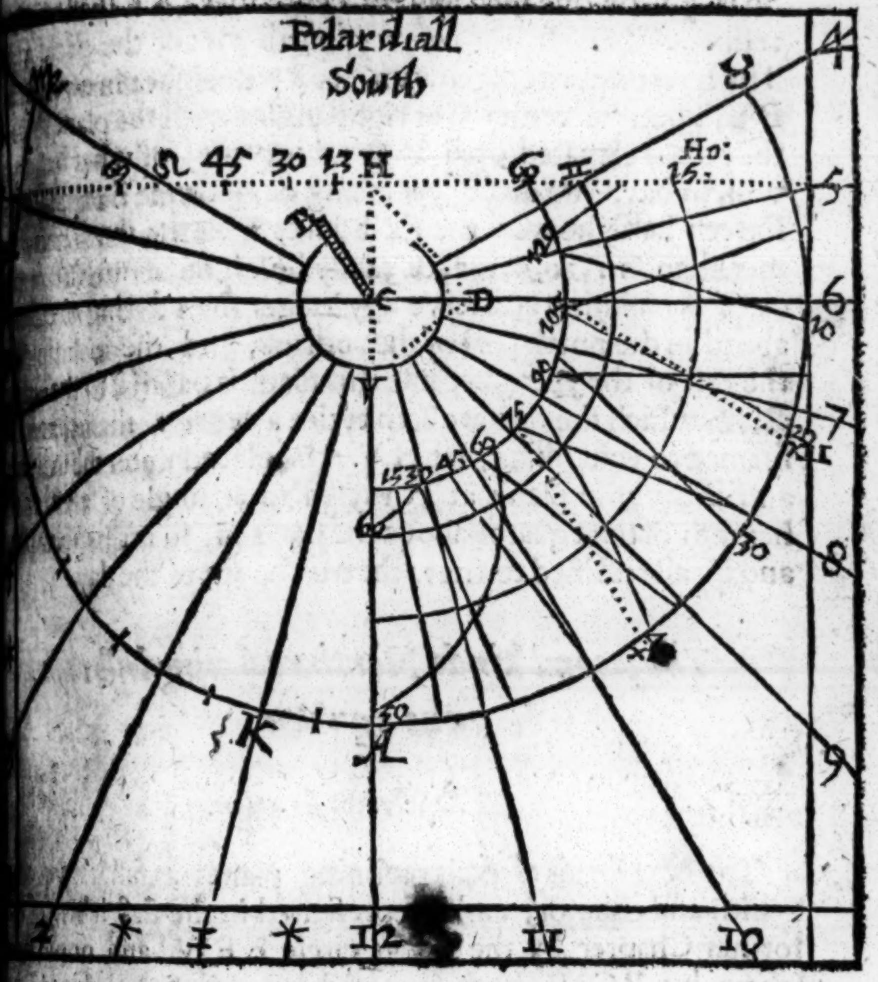
THe direct north reclining planes have the sa varieties that the south had ; for either plane may recline from the zenith just to the equinoctiall, as E D W doth in the first sche of the last Chapter, and then it is a polar pl (as I called it before) because the poles of th plane lie in the poles of the world : or else the plane may re more or lesse than the equinoctiall, as the circles E F W a E B W do, and consequently their poles fall above and un the pole of the world, and the houre lines also differ from t former.

The Demonstration.

The polar Diall is well known to all men to be no more a circle divided into 24 equall parts, which, because the zen is to the horizon as the pole of the world is to the equinocti may bee easily contrived upon the first schem of the form Chapter, by dividing the limb into 24 equall parts. Supp therefore that from the center Z you draw streight lin every 15 d. (the twenty fourth part of the horizon) and t Dyall is made.

The Geometricall projection.

To contrive this Dyall upon the plane, draw two strei lines H V A for the houre of 12, and 6 c 6 for the houre of crossing each other at right angles in C, representing N Z S meridian, and E Z W the prime verticall of the schem; on the center C, with the radius Z S of the schem (equall to of the chord) draw the circle ♍ A ♉, representing the limb the schem N E S W, take off the same chord 15 d, which



both wayes from A, will divide the sayd circle into 24 equall parts, (such as A K is one) thorow which streight lines being drawn from the center C, are the houre lines desired ; and these being contracted or enlarged according to the capacity of the plane, the Dyall is made greater or lesser at pleasure ; but if you like not to be alwayes confined to the same chord, you may draw a circle upon the plane at adventure, and by the last precept of the first Chapter, speedily set out the houre distances thereon ; for such proportion as the sine of 30 d. hath to the sine of 7 d. 30′, halfe the houre arch, such hath the radius of the

 circle

circle in parts, to the twenty fourth part of the circle de-
So if A C be one inch and 77 centesmes, A K shall be 46 cen-
tesmes of an inch, the twenty fourth part of the circle.
The houre lines being drawn, erect a streight pin or wyer
B C, upon the center C at right angles with the plane (be-
the pole is elevated 90 d. above this plane) of what length
will, so have you done; yet seeing our latitude is capable
sixteen halfe houres, the six houres next the south part of
meridian, 11,10,9,1,2, & 3 may be left out as uselesse; nor
can this reclining face serve any longer than during the Sun
aboad in the north part of the zodiack, and the inclining
the rest of the yeere, because this plane is paralell to the equi-
noctiall, which the Sun crosseth twice a yeere: these things
formed to your liking, let H V A be placed upon the meridian
and the whole plane at H raysed to an angle of 38 d. 28'
heighth of the equator above the horizon, so is this polar
and Dyall rectified to shew the true houre of the day.

The second kinde North reclining lesse than the equator.

The Demonstration.

The next sort is of such reclining planes as fall between
zenith and equator, and [illegible] represented in the first schem of the
former Chapter by the [illegible]ckt circle E F W, and in the
schem by F C W, both supposed to recline 25 d. from Z
zenith, Ad therfore unto P Z 38 d. 28′ the compl. of the elevati-
on, Z F 25 d. the reclination, so have you PF 63 d. 28′, the heighth
of the pole or stile above this plane. In this Dyall also
tekindus and others that follow him are mistaken, directing
reclination to be taken out of the elevation, and the remainder
reserved for the heighth of the pole or stile, (which in the
owne example doth substitute 7 d. instead of 83 d.) whereas
they should adde the reclination to the complement of the ele-
vation, as by the schem appeareth, and as in this example
done.

The Arithmeticall calculation.

To calculate the houre lines true, returne to the first schem of the former Chapter. In the triangle P F 1, or rather the quadrantall P D 1 as afore, you have P D 90 d, and P F 63 d. 28′, and D 1 15 d. the measure of the angle at P given, to finde the side F 1, the first houres distance from the meridian upon the plane, *by the first variety of the fift case of R. S. triangles.*

			Logar.
As the sine of P D	90^{d}	0′	10000.00
Is to the sine of P F	63	28	9951.66
So is the tangent of D 1	15	0	9428.05
To the tangent of F 1	13	29	9379.71

This 13 d. 29′ is the true houres distance of 11 and 1 of clock, and seeing there is no other variety, (but increasing the angle at P) in seeking the rest of the houre distances, it is needlesse to repeat the work, but referre you to the table adjoyning; wherein (as often heretofore directed) first set downe all the houres from 12 and their parts.

Houres and parts from the merid.		Equinoctiall distances.	Logarithmes of tangents.	Houre arches on the plane.	Differ.
		d ′		d ′	d ′
12	12				
	½	7.30	9071.09	6.44	6.46
11	1	15. 0	9379.72	13.29	6.51
	½	22.30	9568.89	20.20	6.59
10	2	30. 0	9713.10	27.19	7. 9
	½	37.30	9836.64	34.28	7.21
9	3	45. 0	9951.66	41.49	7.34
	½	52.30	10066.68	49.23	7.47
8	4	60. 0	10190.23	57.10	7.59
	½	67.30	10334.44	65. 9	8.11
7	5	75. 0	10523.61	73.20	8.18
	½	82.30	10832.23	81.38	8.22
6	6	90. 0	infinite.		

Data	Elevation of the pole	D N	51 d	32′.
	Reclination ———	Z F	25	0
Quæsita	Heighth of the stile	D F	63	28

Next set the equinoctiall distances by them, as to 11 an[d] 15 d, to 10 and 2, 30 d. &c. then take into a loose paper Log. sine of P F in the schem 63 d. 28′, 9951.6651, the [ele]vation of the pole above this plane, which added contin[ually] unto the Log. tangents and complements of every houres e[qui]noctiall distance, giveth new Logarith. tangents, whose [ar]ches are the true houre distances (upon the plane) desired, as the table appeareth; which done, the Dyall is to be made in all respects like the horizontall.

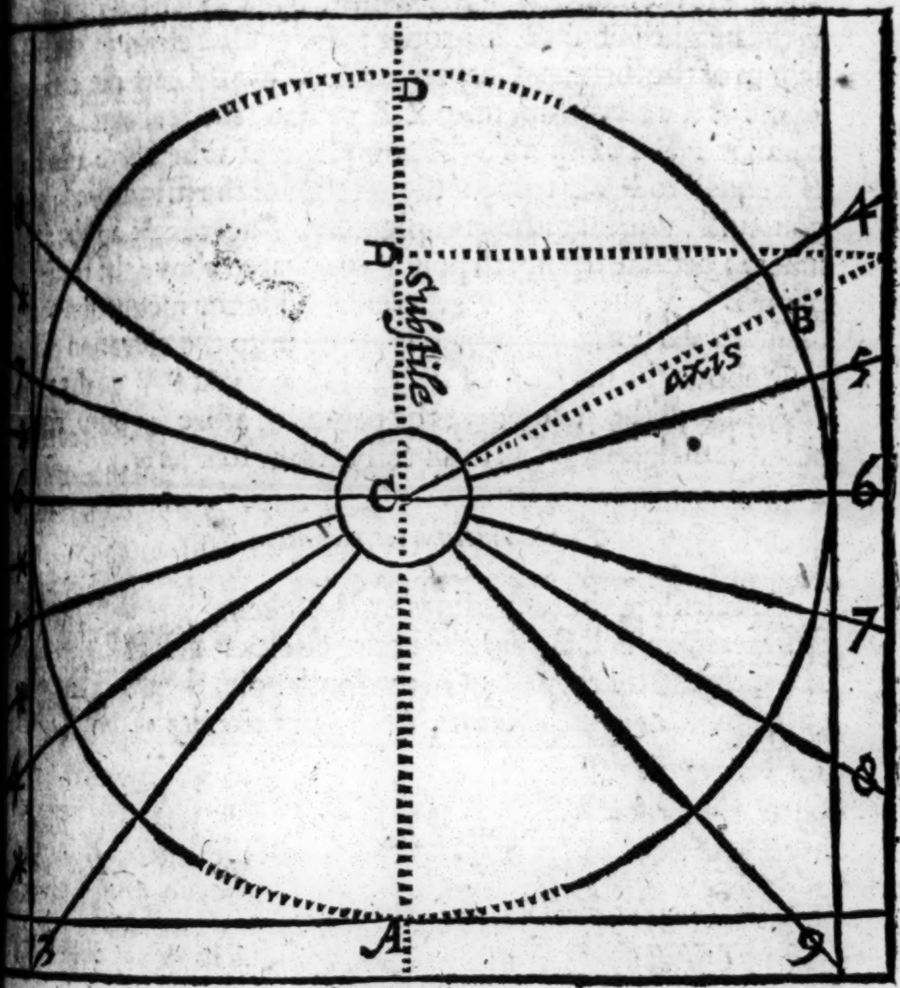
The Geometricall projection.

Draw therefore the horizontall line 6 C 6, crosse it at ri[ght] angles with D C A; upon the center C (at the distance of 60 of the chord) make the circle D B A, representing the recl[ining] plane E F W in the schem; set off the houre distances (by h[elp] of the chord) both wayes from A, the north part of the meri[di]an, as they are calculated in the table, *vizt.* for 9 and 3, 41 d[.] for 8 and 4, 57 d. 10′, for 7 and 5, 73 d. 20′, &c. from the cen[ter] C thorow those pricks draw streight lines, and they sha[ll be] the true houre lines desired; continue 7 and 8, and 5 and [4] thorow the center to the opposite parts, so have you the sa[me] houres above the 6 of clock line also; this done, with the sa[me] chord set 63 d. 28′ from D to B, draw the line C B for the heighth of the stile: let the south part of the Dyall at D sta[nd] upwards upon the plane, elevated to 65 d. above the horizo[n], that the side C B of the stile being perpendicularly erected o[n] the substile line C D, may respect the north pole, so have yo[u] done; the houres about the meridian, *vizt.* 11 and 1, and [10] and 2, can never receive any shadow, because of the small recl[i]nation of the plane from the zenith, and therefore needlesse [to] put them on. For more particular proofe whereof, I refer you to the fourth proposition in the thirty fourth Chapter; [...]
whe[...]

whatsoever is defective in the reclining side, will bee supplied in the opposite inclining side, upon which the Sunne shineth as soone as it forsaketh the other.

North reclining 25 d.

South.



North.

The third kinde North reclining more than the equator.

The Demonstration.

The last sort is of such reclining planes as fall between the horizon

horizon and equator, repreſented in the firſt ſchem of the for-
mer Chapter, by the circle E B W, but in the later ſchem
B C V, ſuppoſed to recline 70 d. from the zenith.

Now the equator cutting the axis of the world at right an-
gles, all planes that are paralell thereto have their ſtiles ele
90 d. above the plane; and by how much more than the equ
any plane reclineth from the zenith, by ſo much leſſe than
is the heighth of the ſtile proper to it. Therefore in the
ſchem of the former Chapter adde P Z 38 d. 28′ the com
ment of the elevation, unto Z B 70 d. 0′ the reclination;
totall is P B 108 d. 28′, the complement whereof to 180 d.
B S equall to P V 71 d. 32′ the heighth of the ſtile deſired;
you will without the complement, (agreeable to the
ſchem) becauſe the north pole P is elevated above the reclin
plane B C V, the arch P V; therefore adde the inclination of the
plane to the horizon, which is 20 d. unto the elevation of the
pole above the horizon 51 d. 32′, ſo have you P V 71 d. 32′
elevation of the pole above the plane, as afore; unto wh
heighth make the Dyall in all reſpects, as formerly.

The Arithmeticall calculation.

To calculate the houre lines by the ſchem, you muſt ſuppo
the meridian P F B, and the houre circles P 1, P 2, P 3, &c.
be continued till they meet in the ſouth pole, then will the pro
portion be the ſame as afore, *by the firſt variety of the fift ca
of R. S. triangles.*

			Log
As the ſine of P D, counting from the ſouth pole to the equator	90 d	0′	10000
Is to the tangent of D 1, one houres diſtance upon the equator	15	0	9428
So is the ſine of P B, counting from the ſouth pole to the plane	71	32	9977
To the tangent of B 1, the firſt houres diſtance upon the plane	14	16	9405

And this being all the variety of the calculation, we need n
reiter

…rate the work; now therefore begin the table as you did the former, setting to every houre equidistant from 12, the …noctiall distances of 15 d. 30 d. 45 d. &c. proper unto them; then take into a paper the Logar. sine of the heighth of the stile …d. 32′ 9977.04, which being continually added unto the Log. tangents of 15 d. and 75 d. for 11 and 5 of clock, of 30 d. and 60 d. for 10 and 4 of clock, &c. shall beget new Log. tangents, the arches whereof are the true houre distances upon the plane, as you see in the example.

Houres and parts from the merid.		Equinoctiall distances.	Logarithmes of tangents.	Houre arches on the plane.	Differ.
12	0	d ′		d ′	d ′
	½	7.30	9096.47	7. 7	
11	1	15. 0	9405.09	14.16	7. 9
	½	22.30	9594.26	21.27	7.11
10	2	30. 0	9738.58	28.43	7.16
	½	37.30	9862.02	36. 3	7.20
9	3	45. 0	9977.14	43.30	7.26
	½	52.30	10092.06	51. 2	7.32
8	4	60. 0	10215.70	58.41	7.39
	½	67.30	10359.81	66.25	7.44
7	5	75. 0	10548.98	74.14	7.49
	½	82.30	10857.61	82. 6	7.52
6	6	90. 0	infinite.		7.54

Data { Elevation of the pole P N 51 d 32′.
Reclination ——— Z B 70 0

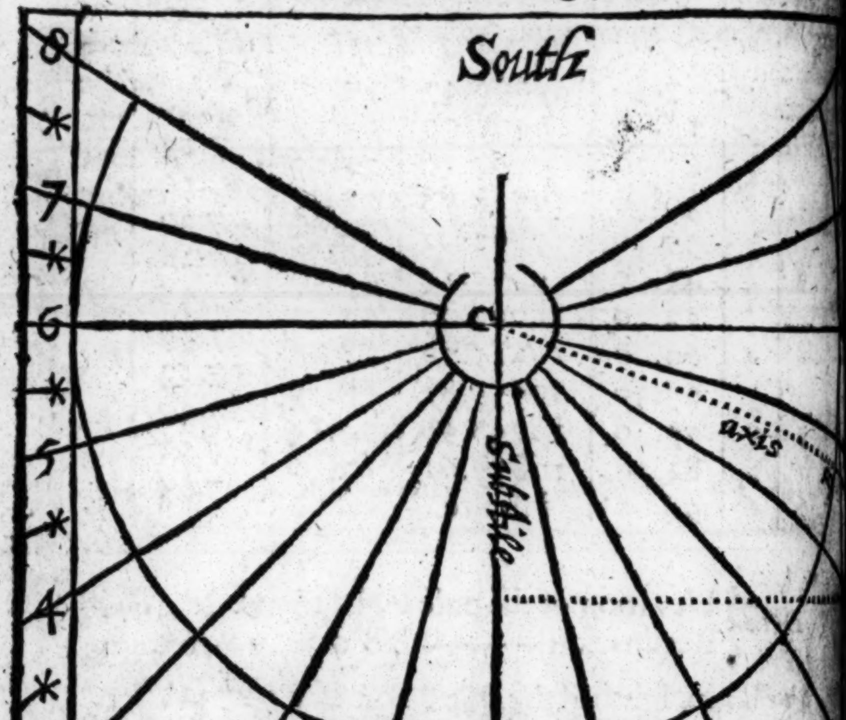
Quæsita Heighth of the stile P B or P V 71 d 32′.

The Geometricall projection.

This done, draw two streight lines, C A 12, and 6 C 6, crossing at right angles in C: upon the center C (with 60 d. of the chord) make the circle 6 A 6, representing the reclining plane of the schem E B W, upon which circle the houre arches taken

taken out of the table, and prickt down both wayes f (by help of the chord) and unto those pricks ſtreight lines drawn from the center C, you have the true houre lines red; by the ſame chord ſet off the heighth of the ſtile f to B, *vizt.* 71 d. 32′, and draw the prickt line C B, repreſ the axis : erect C B at right angles over the ſubſtile C which placed in the meridian line, the center C reſpecti ſouth, and the whole plane at C elevated to an angle of above the horizon, that the axis C B may point up to the pole, you have finiſhed the Diall to the plane propoſed.

North reclining 70 d.



n may further note, that because the reclination of this plane the zenith is lesse than the reclination of the tropick of ♑, ich is 75 d. 3', therefore after the Sunnes south declination 8 d. 28', (as appeares in the fourth proposition of the thirty th Chapter) it passeth off this side of the plane, to the opposite part, upon which the rest of the yeere is supplied.

Lastly, as all other planes have two faces, respecting the ntrary parts of the heavens, so also have these recliners six posite sides looking downwards to the nadir, as these looke wards to the zenith; therefore may you by the very same les make all the inclining Dyals also; or if you will spare that bour, and make the same Dyals serve for the opposites, turne e centers of the incliners downwards, which were upwards the recliners, and those upwards in the incliners which were wnwards in the recliners; and after this conversion, let the ures on the right hand of the meridian in the recliner become n the left hand in the incliner, and contrary, so have you done hat you desired: and this is a generall rule for the opposite sides of all planes, which shall bee made more manifest in the 21 and 22 chapters, where I purposely treat of inclining planes.

Chap. XV.

To draw the houre lines upon a declining reclining, or declining inclining plane.

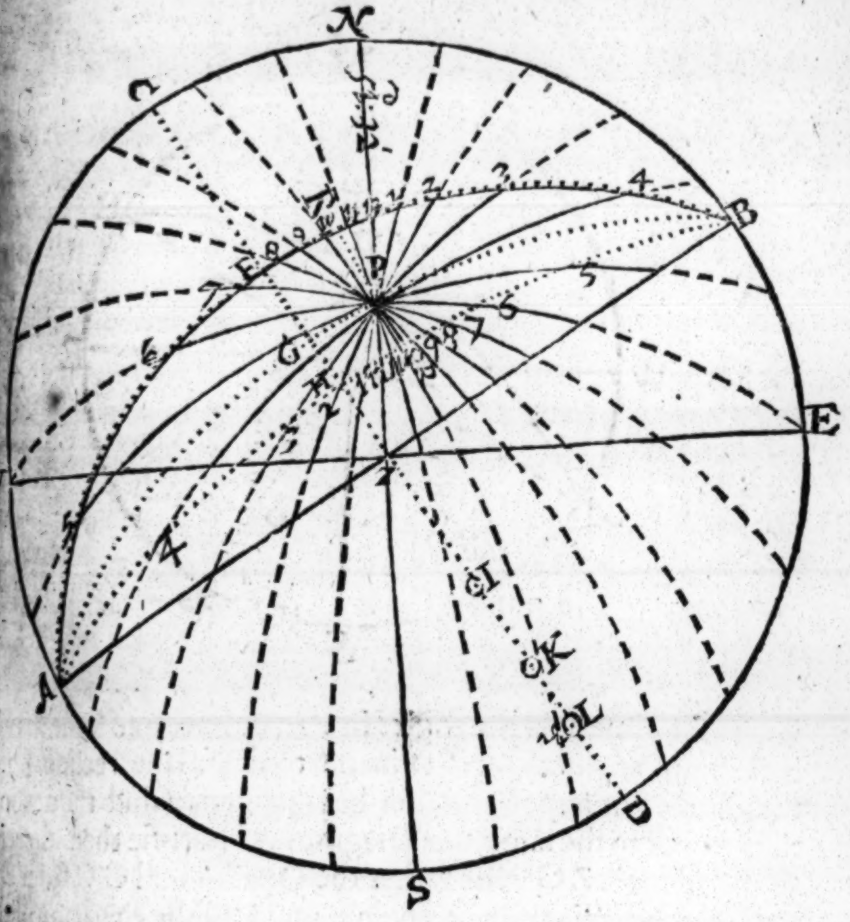
IN declining reclining planes, there be the same six varieties that were in the former reclining north and south; for either the declination may bee such that the reclining plane will fall just upon the pole, and then it is called a declining equinoctiall; or it may fall above, or under the pole, and then it is called a south declining east and west recliner: on the other side the declination may bee such, that the reclining plane shall fall just upon the intersection of the meridian and equator, and then it is called a declining polar;

lar; or it may fall above or under the ſaid interſection,and
it is called a north declining eaſt and weſt recliner: of all w
I will give particular examples, that by imitation of them
thing may remayn doubtfull.

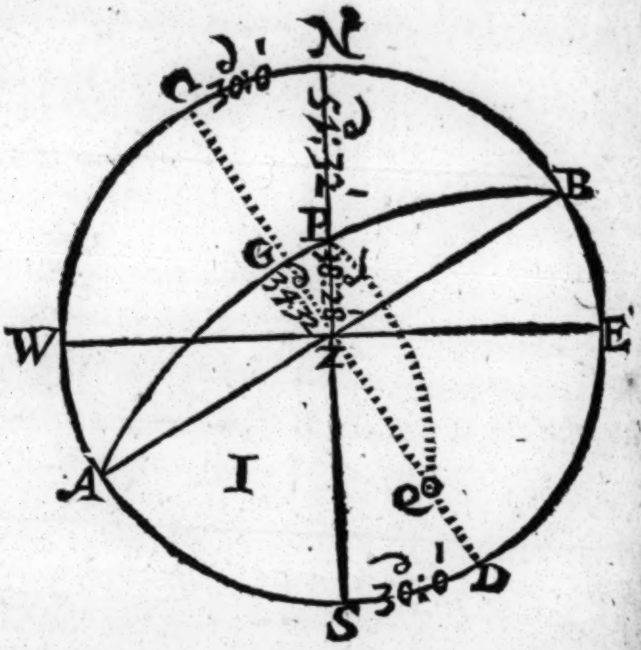
And firſt for the better underſtanding of the work,you
remember that every declining reclining plane hath both a
and flat; the baſe perpendicular, but declining, therefore (a
fore) ſituate under ſome azimuth or other; and the flat re
ning, which to the common mans underſtanding is beſt rep
ſented by the roofe of a houſe, falling back from the perpe
cular of the wall whereupon it ſtandeth; but upon the ſph
by the circle of poſition (as afore) ſuppoſed to move upon
horizon, with the declining baſe, and to fall from the ze
either wayes upon that azimuth which cutteth the baſe at ri
angles, by reaſon whereof the pole of the reclining circle
wayes ſo much elevated above the horizon as the circle it
(repreſenting the plane) reclineth from the zenith: all w
may be plainly ſeen in the ſchem following.

The Demonſtration.

Let the baſes of the recliners bee repreſented by A Z B decli-
ning from the eaſt point E 30 d. to B as much as the po
thereof C and D do decline from the north and ſouth parts
the meridian N and S. The three varieties of ſouth reclin
upon the ſame baſe, are repreſented by the three prickt cir
A H B falling between the pole of the world and the zen
A G B juſt upon the pole, and A E B between the pole and h
rizon, and the particular pole of each plane is ſo much ele
ted above the horizon, (upon the azimuth D Z C croſſing t
baſe at right angles) as the plane it ſelfe reclines from the ze
nith, and marked in the ſchem with I K and L. Now to avo
confuſion of lines,it will not be amiſſe to draw theſe three ci
ſeverally, that you may the more diſtinctly perceive what y
are to finde in each of them.



In the firſt, the declining Æquinoctiall is repreſented, whoſe baſe A Z B declineth 30 d. from the Eaſt and Weſt line E Z W, equall to the declination of the South pole therof, 30 d. from the South part of the Meridian S eaſterly unto D, the reclining plane is A G B, reclining from the Zenith Z upon the Azimuth C Z D, the quantity of Z G 34 d. 32′: and paſſeth thorough the pole P: Set off from D to Q: the reclination Z G; and Q ſhall repreſent the pole of the reclining plane: ſo much elevated above the horizon at D, as the circle A G B, repreſenting the plane, declineth from the Zenith Z; from the pole of World P to the pole of the plane Q, draw an arch of a great circle P Q: whoſe centre will fall upon the periphery of the reclining plane, ſeeing



it cuts the ſame at right angles in P; And becauſe ſome may be deſirous to any declination giuen, to fit a plane reclining iuſt to the pole: or any reclination being given to find the declination proper to the ſame, this Diagram will ſatisfie them therein. In the triangle Z G P, or rather the Quadrantall G C B, let B S or C N the declination be given, and P N the elevation of the pole: to find the arch C G, whoſe complement is the reclination G Z, *by the first varietie of the 16 caſe of R.S. Triangles.*

		Logar.
As B N the Coſine of N C the declination	30^d $0'$	9937.53
Is to the ſine of B C	90 0	10000.00
So is the tang. of N P the height of the pole	51.32.	10099.91
To the tangent of C G	55.28.	10162.38

Whoſe complement is G Z 34^d $32'$ *the reclination deſired.*

And by the converſe for the other part:

		Logar.
As C G the cotangent of the reclination	34 d 32′.	10162.38
To N G the tangent of the elevation	51 32.	10099.91
So is the sine of C B	90. 0	10000 00
To the sine of N B	60. 0	9937. 53

Whose complement N C 30 *d. is the declination desired.*

The Arithmeticall Calculation.

1 In this first example, you are to find two things: first, the arch of the plane or distance of the Meridian and Substile from the Horizontall Line; which in this Scheme is P B, the intersection of the reclining plane with the Horizon, being at B. And secondly, the distance of the Meridian of the place S Z P N from the Meridian of the plane P Q: which being had, the Diall is easily made; wherefore in the Triangle Z G P right angled at G you have the side G Z given 34 d. 32′ the reclination; and you have Z P given 38 d. 28′ the complement of the elevation; and the angle at Z 30 d. whose measure is N C the declination; to find G P, whose complement is P B, either by the small Triangle Z G P, or by the quadrantall Z C N, *by the 1 varietie of the first, third, fourth, or fifth Cases of R. S. Triangles:* or againe if you will (such is the variety of Triangles) by the small Triangle P N B, or the quadrantall B C G, you may without the complement find P B your desire.

		Logar.
1 *As the sine of* Z G P	90 d. 0′	10000.00
Is to the sine of P Z	38. 28.	9793.83
So is the sine of G Z P	30. 0.	9698.97
To the sine of G P	18. 7	19492.80
Whose complement is P B	71. 53	

Or againe in the Triangle P N B you may find P B without seeking the complement, *by the first of the eighth case of R. S. Triangles.*

		Logar.
As the ſine of the angle N B P	55 d. 28′.	9915.82
Is to the ſine of the ſide P N	51.32.	9893.74
So is the ſine of the angle P N B	90. 0.	10000.00
To the ſine of the ſide P B	71. 53.	9977.92

The diſtance of the Meridian and Horizon.

The ſecond thing to be found is the diſtance of the Meridian of the place, which is the houre of 12, from the Subſtile or Meridian of the plane, which is the angle it ſelfe of the two Meridians, repreſented by Z P Q; in which point *Wittekindus* and others following him were alſo miſtaken: making the angle of declination to be the diſtance betweene the two Meridians; by which errour, putting the 12 of clocke line out of the true place, all the reſt of the houres by conſequent are erroneous alſo.

To find this angle Z P Q, you muſt firſt find the angle Z P G, which taken out of G P Q 90 d. leaveth the angle Z P Q by *the ſecond of the fifteenth caſe of R.S. Triangles.*

		Logar.
2 *As the ſine of the ſide P Z*	38 d. 28′.	9793.83
Is to the ſine of the angle Z G P	90 0	10000.00
So is the ſine of the ſide Z G	34.32.	9753.49
To the ſine of the angle Z P G	65.41.	9959.66

Take the angle Z P G 65 d. 41′ out of G P Q 90 d. there reſteth Z P Q 24 d. 19′ for the difference of Meridians, which gives the diſtance of 12 of clock from the Subſtile; or againe, *by the ſecond of the ſecond caſe of R. S. Triangles.*

		Logar.
As the Radius	90 d. 0′.	10000.00
Is to the ſine of the latitude	51.32.	9893.74
So is the tangent of the declination	30. 0.	9761.44
To the tangent of the angle betweene the two Meridians.	24.19.	19655.18

Now

Now because 24 d. 19′ is more then 15 d., one houres distance from the Meridian: and lesse then 30 d. two houres distance; I conclude that the Substile shall fall betweene 10 and 11 of clocke, on the West side of the Meridian: because the plane declineth East; and as the very Scheme it selfe directeth, being inverted, or drawne to the South pole, as indeed it ought to be.

Data
- Elevation of the pole P N — 51^d. 32′.
- South
  - Declining East S D or C N — 30 0.
  - Reclining — Z G 34. 32.

Quæsita
1. length of the stile ——— E F -- 0 2957,
2. distance of the Horizon & Meridian - P B - 71 d. 53
3. angle betweene the Meridians — Z P Q - 24. 19.

Houres and parts from the substile.		Equinoctiall distances.	naturall tang or the houre distances upon the plane.	Houres and parts from the substile.		Equinoctiall distances.	naturall tang. or the houre distances upon the plane.
		d ′				d ′	
.	½	.1.49	.0 022	10	2	.5.41	.0 009
11	1	.9.19	.0 164	.	½	13.11	.0 234
.	½	16.49	.0 302	9	3	20.41	.0 377
12	12	24.19	.0 452	.	½	28.11	.0 536
.	½	31.49	.0 620	8	4	35.41	.0 718
1	11	39.19	.0 819	.	½	43.11	.0 938
.	½	46.49	.1 065	7	5	50.41	.1 [illegible]21
2	10	54.19	.1 398	.	½	58.11	.1 612
.	½	61.49	.1 866	6	6	65.41	.2 213
3	9	69.19	.2 648	.	½	73.11	.3 308
.	½	76.49	.4 269	5	7	80.41	.6 095
4	8	84.19	.10 048	.	½	88.11	.31 528

 These

These things prepared, make the Table for the houres; ad unto them their Equinoctiall distances from the Substile, as the example adjoyning; wherein because 11 of clocke is but 1 d. from the Meridian, take 15 d. out of 24 d. 19'. there shall re maine 9 d. 19' for the Equinoctiall distance of the houre fro the Substile; then take 24 d. 19' out of 30 d. the distance of 1 of clock, there shall remaine 5 d. 41', for that houres dista from the Substile; the rest of the houre distances are easily ha by continuall addition of 15 d. Vnto these houres distances joy the naturall tangents as you did in the East and West Dia which will give you the true distances upon the line LK of th plane of every houre from the Substile: seeing that LFK i tangent line in respect of the Radius EF, you may also by he of the chord set the Equinoctiall distance from the Substile up each arch HOF: and CEO: and from their centers dr streight lines, to intersect the tangent lines 6E3 and LNK which shall agree precisely with the naturall tangents aforesai if there be no error in the worke.

FL the naturall tangent of 6 of clock —	2 213	
FK the naturall tangent of 3 of clock —	2 648	*Logar.*
LK the whole line is —	4 861	0686.7256
EF the length of the stile proportioned to LK is —	0 2057	9313.2744
	Comple-	0

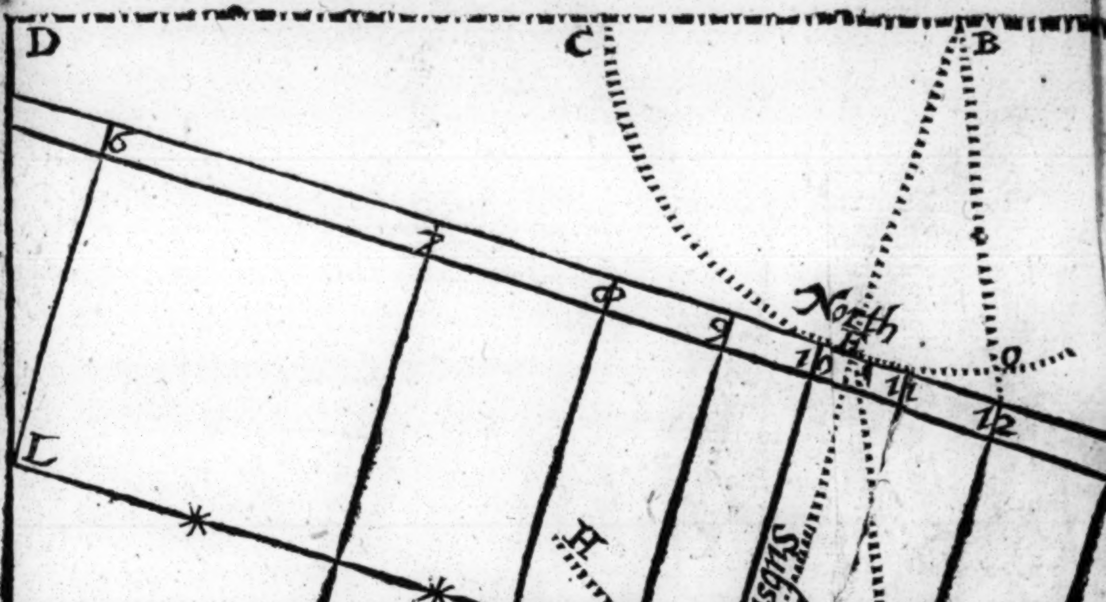
Arithmeticall complement thereof gives the length of the stile

The Geometricall projection.

To draw this Diall true, consider the Scheme, let ABC be the Horizontall line, drawne upon the reclining flat, m convenient for the houre lines; which will be alwayes a pa lel to the base thereof, representing AZB of the Scheme; up any part of this line as at B, make an arch of a circle CEO, (quall to 60 d. of the chord) representing AGB the reclin plane in the Scheme; from C unto E reckon the distance of in the Scheme betweene the Horizon and Meridian, which veth the place of the Substile, on the Westside of the center

wh

Place this folio 174.



South declining East 30 *d.* 0'.
Reclining 34 *d.* 32'.

, make the Table for the houres; add
tiall distances from the Substile, as i
wherein because 11 of clocke is but 1
e 15 d. out of 24 d. 19′. there shall r
quinoctiall distance of the houre fro
4 d. 19′ out of 30 d. the distance of 1
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ct the tangent lines 6 E 3 and LN:
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he worke.

of 6 of clock —	2 213	
of 3 of clock —	2 648	*Logar.*
——————	4 861	0686,7256
eproportioned }	0 2057	9313,2744
——— }	*Comple-* 0	

ent thereof gives the length of the stile.

eometricall projection.

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drawne upon the reclining flat, m
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epresenting AZB of the Scheme; up
B, make an arch of a circle CEO, (
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om C unto E reckon the distance of
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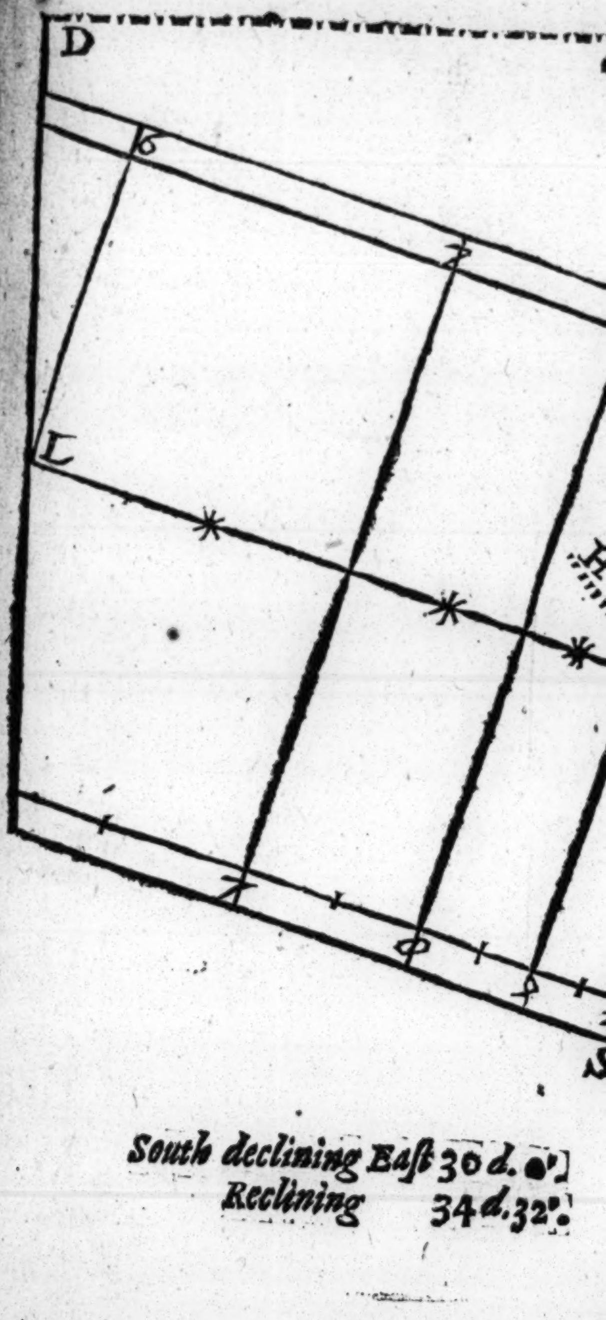
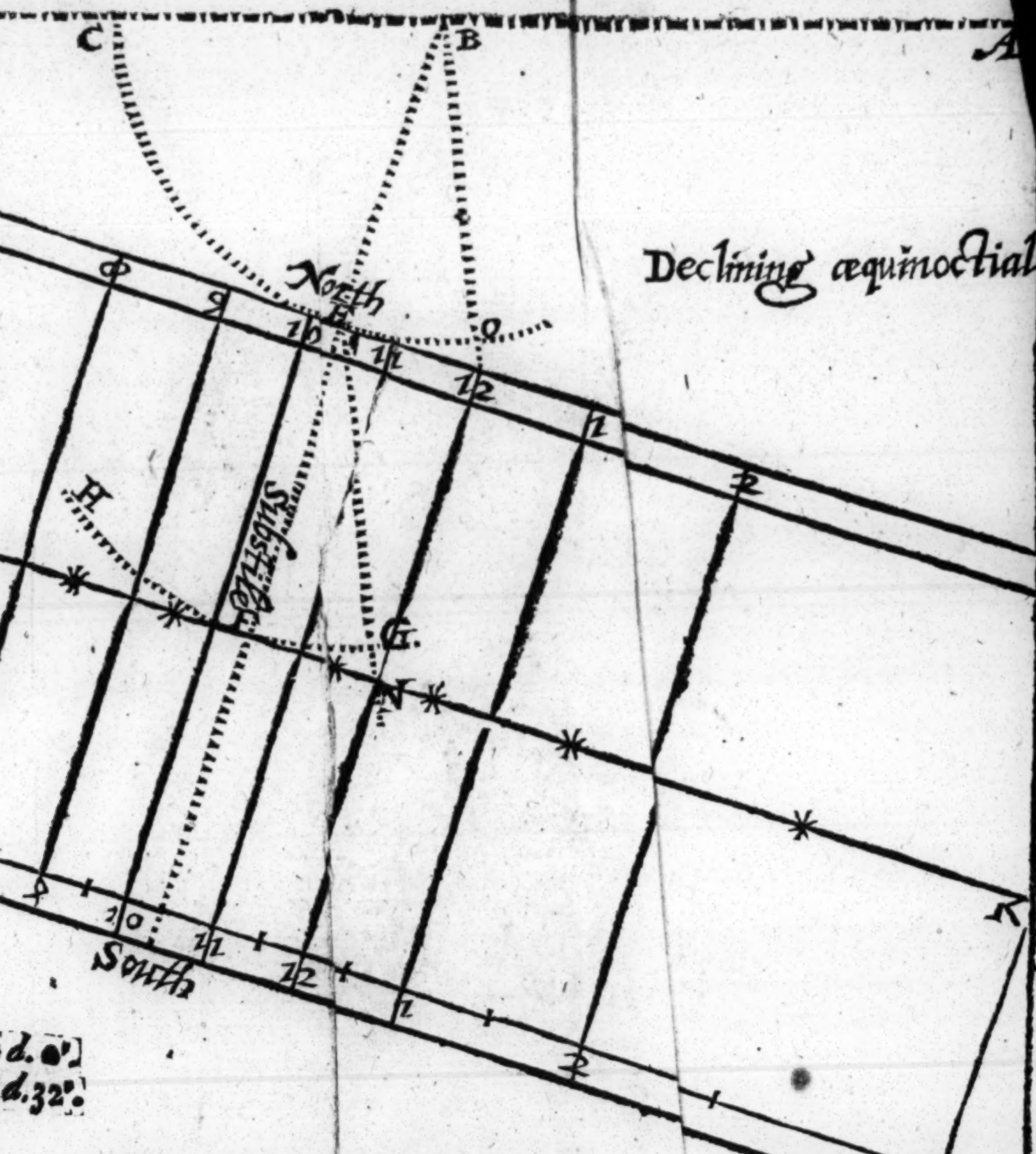
bstile, on the Westside of the center
wh



South declining East 30 *d.* 0′.
Reclining 34 *d.* 32′.

Place this folio 174.



when the declination is Easterly; on the East side when Westerly agreeable to the Scheme inverted; thorough the point E draw the line B E F for the Substile line; upon E, or any other part of the Substile where you will make another arch of a circle (with the same chord) F O H: for the Equinoctiall crosse the Substile at right angles, both in E and F: 6 E 3, and L F K shall be two tangent lines to the arches C E O and F O H, drawne with the Semidiameters B E and E F; upon the arch G F H from F to G reckon the angle betweene the Meridians 24 d. 19′: or take the naturall tangent thereof, 0 $\underline{45}$ (opening the Sector to the Radius E F) and set it upon the streight line F K from F to N; doe the like upon the other arch, and tangent line E 3: and draw the lines E O N, and B O 12, whose intersections upon the tangent lines shall be in the Meridian of the place: and that Easterly from the Substile when the declination is East, (as in this example) but Westerly when the plane declineth West (because in this Diall the Substile is first given, and the Meridian found from that.) Set of the rest of the tangents from F and E, both wayes by helpe of the Sector, or line divided into 100 parts, as you find them in the Table, *viz.* for 11 H. 0 $\underline{164}$ for 1 H. 0 ^{819} for 2 H. 1 ^{392} and so of the rest. Vnto every one of these points draw parallels to the substile, which will crosse the tangent lines at right angles, and so be all the houre lines truly drawne. The stile must either be a streight pin of the length of E F the radius, erected perpendicularly upon the plane in the point F, or else along square at the same heighth erected ouer the Substile, and so is the Diall finished for use; and further you may note, that by the rules of the 9 or 13 Chapters, you may proportion both the length of the stile, and wideth of the houre lines to the capacitie of the plane, seeing that L F K, is a tangent line to the Radius E F, as you see done by the tangents of F L, and F K, the two extreme houres of the Diall. The Diall being drawne and placed, according to the declination 30 d. Easterly, and the whole plane at E raised to an angle of 55 d. 28′ the complement of the reclination, the shadow of the stile shall give the houres of the day desired.

CHAP.

CHAP. XVI.

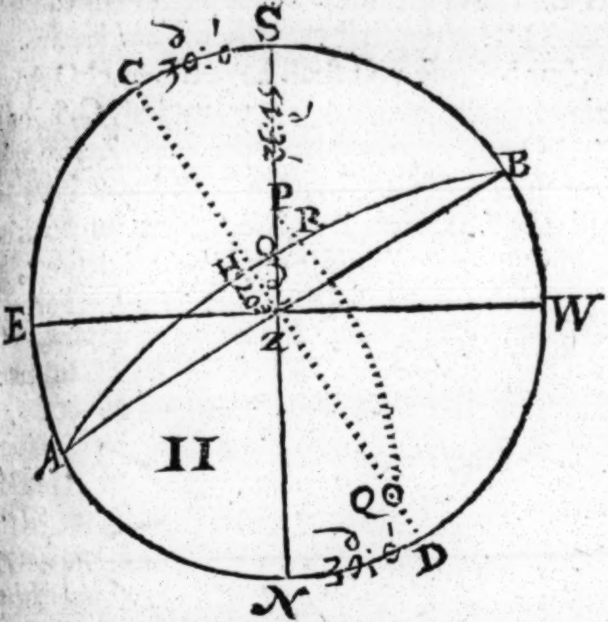
To draw the houre lines upon a South reclining plane, declining East or West which passeth betweene the Zenith and the pole.

The second Example.

IN this ſecond kinde of declining reclining planes, the ſouth pole is elevated above the pole, as may appeare by this or the greater Scheme of the former Chapter: wherein the circle A H B repreſenting the plane, falleth betweene the Zenith Z, and the North pole P, and therefore hideth that pole from the eye, and forceth you to ſeeke the elevation of the contrary pole above the plane; which notwithſtanding maketh the like and equall angles upon the South ſide objected to it, as the North pole doth upon the Northſide; (as is proved in the Diagram of the 12 Chap.) ſo that either you may imagine the Scheme to be turned about, and the North and South points changed, and then it will repreſent the South part of Heaven; or you may calculate the houres as it ſtandeth, remembring to turn the ſtile upwards or downwards, and change the numbers of the houres, as the nature of the Diall will direct you.

Data	Elevation of the pole		P S	51 d. 32′.
	South	Declining East —	S C	30 d. 0.
		Reclining —	Z H	20. 0.

Quæſita	1 diſtance of Meridian and Horizon	O B	78 d. 50
	2 heighth of the ſtile —	P R	13. 40
	3 diſtance of ſubſtile and Meridian —	R O	7. 30
	4 angle betweene the two Meridians —	O P R	28. 52



The Demonstration.

In this and all the like declining reclining Dials, there are foure things to be sought, before you can calculate the houres, the first is the distance of the Meridian from the Horizon upon the plane, which in this particular Scheme is part of the arch of the plane O B; N P S being the meridian of the place, and B the point in the Horizon intersected by the plane.

Secondly, the heighth of the pole or stile above the plane, which is part of the great circle P R Q, passing from the pole of the plane at Q unto the pole of the World at P, and elevated above the plane A H B, the quantitie of P R.

Thirdly, the distance of the substile and meridian upon the plane, represented by O R, P R Q being the substile or meridian of the plane, and N P S the meridian of the place.

Lastly, the angle betweene those two meridians O P R, all which foure demands, are by the helpe of Logarithmes found out at five easie operations, in manner following.

The Arithmeticall calculation.

In the Rectangular Triangle O S B, you have the right Angle at S, and the acute Angle at B, whose mea-

measure is C H, and the side S B, comprehended by them; find the side O B by the first varietie of the seventh case of R. Triangles: but because you shall have use of H O, it will be better to deale with the quadrantall triangle Z C S, or the lesser triangle Z H O; wherein you have the angle Z 30 d, whose measure is the arch C S the declination, and you have part of the quadrantall side Z C, *vizt.* Z H, the reclination 20 d: to find the lesser arch H O, whose Complement is O B desired, by the second variety of the fifth case of R. S. Triangles. For

		Logar.
1 *As the whole sine Z C*	90 d.0	10000.00
Is to the sine of the side Z H	20.0	9534.05
So is the tangent of C S	30.0	9761.44
To the tangent of H O	11.10	9295.49

Whose Compl: is O B 78 d. 50', the distance of the Meridian from the Horizon.

2 In the triangle H Z O, you have the angle at Z 30 d. and the side opposite H O 11 d. 10' with the right angle at H; to find the side Z O, which taken out of Z P, leaveth P O by the first varietie of the eighth case of R.S. Triangles. For

		Logar.
As the sine of the angle H Z O	30 d.0'	9698.97
Is to the sine of the side H O	11.10	9287.05
So the sine of Z H O	90.0	10000.00
Is the sine of the base O Z	22.47	9588.08

Out of Z P 38 d. 28', take Z O 22 d. 47', there resteth P O 15 d. 41'.

3 In the verticall triangle Z H O, and P R O, because the sines of the Hypotenusas, and perpendiculars are proportionall, you may deal with both together to find P R the heighth of the stile by the 15 of the fourth of *Regiomontanus*, or the second of the 14 of *Finkius*; For

			Logar.
[As] the sine of the hypotenusa Z O	22 d.	47	0412,00, arith. cō.
[is] to the sine of the perpendicular Z H	20	0	9534,05
[So is] the sine of the hypotenusa P O	15	41	9431,88
[To] the sine of the perpendicular P R	13	49	19377,93

The heighth of the stile desired, (where you may remember [th]e former caution, to auoid substraction, because the Radius is one of the three proportionals given.

4 In the triangle P RO, you have the sides P R, and P O gi[ue]n, and the right angle at R, to find the side O R, by the second [va]riety of the third case of R S Triangles.

			Logar.
As the Cosine of P R	13 d,	49'	9987,25
is to the sine of P R O	90	0	10000,00
So is the Cosine of P O	15	41	9983,52
To the Co[sine o]f O R	7	30	9996,27

The distance of the substile from the meridian.

5 In the same triangle P RO you have the three sides given, [and] the right angle at R; to find the angle at P, by either varie[ty] of the 15 and 16 Cases of R.S Triangles. For

			Logar.
As the sine of the side P O	15 d,	41'	9431,88
Is to the sine of the angle P R O	90	0	10000,00
So is the sine of the side RO	7	30	9115,69
To the sine of the angle R P O	28	52	9683,81

Now as in all the former workes the angle P betweene the [tw]o Meridians being 28 d. 52', which is more then one houres [dis]tance from the Meridian, and lesse then two, you may con[c]lude that the substile must stand betweene the first and second [ho]ure from the Meridian or 12 of clock Westerly, because the [de]clination is Easterly, by that meanes to bring the shadow [s]ooner upon the meridian of the plane, then of the place; where-
fore

fore now returne to the generall scheme of the fifteenth Chap-ter, and let fall a perpendicular betweene 11 and 10 of clock, but somewhat neere unto 10, as is the prickt line P R upon circle A H B, by helpe whereof you shall finde the true houre distances as followeth.

Houres and parts from the substile.		Equinoctiall distances.	Logarithmes of tangents.	Houre arches on the plane.	Differ.
		d '		d '	d '
.	½	6.22	8425.51	1.32	1.50
11	1	13.52	8770.38	3.22	1.58
.	½	21.22	8970.36	5.20	2.10
12	12	28.52	9119.29	7.30	2.28
.	½	36.22	9245.02	9.58	2.57
1	11	43.52	9360.74	12.55	3.43
.	½	51.22	9475.25	16.38	4.56
2	10	58.52	9596.87	21.34	[illegible]
.	½	66.22	9736.87	28.37	[illegible]
3	9	73.52	9916.63	39.32	18.1
.	½	81.22	10196.57	57.33	27.43
4	8	88.52	11081.64	85.16	

Houres and parts from the substile.		Equinoctiall distances.	Logarithmes of tangents.	Houre arches on the plane.	Differ.
		d '		d '	d '
10	2	1 8	7674.22	0. 16	1.49
.	½	8 38	8559.29	2. 5	1.52
9	3	16. 8	8839.24	3. 57	2. 1
.	½	23.38	9018.99	5. 58	2.14
8	4	31. 8	9158.99	8. 12	2.36
.	½	38.38	9280.61	10.48	3. 9
7	5	46. 8	9395.11	13.57	4 1
.	½	53.38	9510.84	17.58	5.27
6	6	61. 8	9636.56	23.25	7.59
.	½	68.38	9785.50	31.24	12.49
5	7	76. 8	9985.48	44. 3	20.54
.	½	83.38	10330.35	64.57	

ft, therefore make a table for the houres as formerly dire-
, wherein because the substile fals betweene 10 H. and
an houre past, begin with the halfe houre first, and take 22
0' the Equinoctiall distance of 10 H. and ½ from the Meri-
n, out of 28 d. 52', the distance of the substile from the Meri-
an, there rests 6 d. 22', the distance thereof from the substile;
likewise take 28 d. 52', the distance of the substile, out of
d. the Equinoctiall distance of 10 of clock from the Meri-
ian, there resteth 1 d. 8', for the distance of 10 of clock from
substile: Having these two distances on each side of the sub-
le by continuall addition of 7 d. 30' for ½ houres, and of 15 d.
whole houres, make up the Equinoctiall distances of the
of the houres, as in the example; Now because 11 H. and 5
12 H. and 6 H. 1 H. and 7 H. 2 and 8 H. 3 and 9 H. and 4 and
H. are 90 d. distant in the Equinoctiall each from other,
refore 11 houres being 13. d. 52' on the one side, 5 H. shall
76 d. 8', distant from it on the other side, as by the former
tion doth appeare: and by reason that the Equinoctiall di-
ce of one houre is complement to the other 90 d. distant
m it, you may at the same work (as hath been often shewed)
the distance of both upon the plane at once; for if you tran-
e the Log. Sine of the heighth of the stile into a paper, and
e it to the Logarithm: tangent of 13 d. 52', you product a
w Log: tangent for the arch of 11 of clock, and adde it to the
garithm: tangent of 76 d. 8', the Complement thereof, you
duct a new Logarithm: tangent for the arch of five of clock,
hich will be the same with the operation at large, by the first
tie of the fift case of R. S Triangles as in this Example.

			Logar.
the sine of P R 11 Scheme 15 Chapter	90 d.	0'	10000.00
to the tangent of the angle R P 11	13	52	9392.45
is the sine of the heighth of the stile P R	13	49	9378.06
the tangent of the side R 11	3	22	18770.51

And by the same case for R 5 in the triangle R P 5.

As

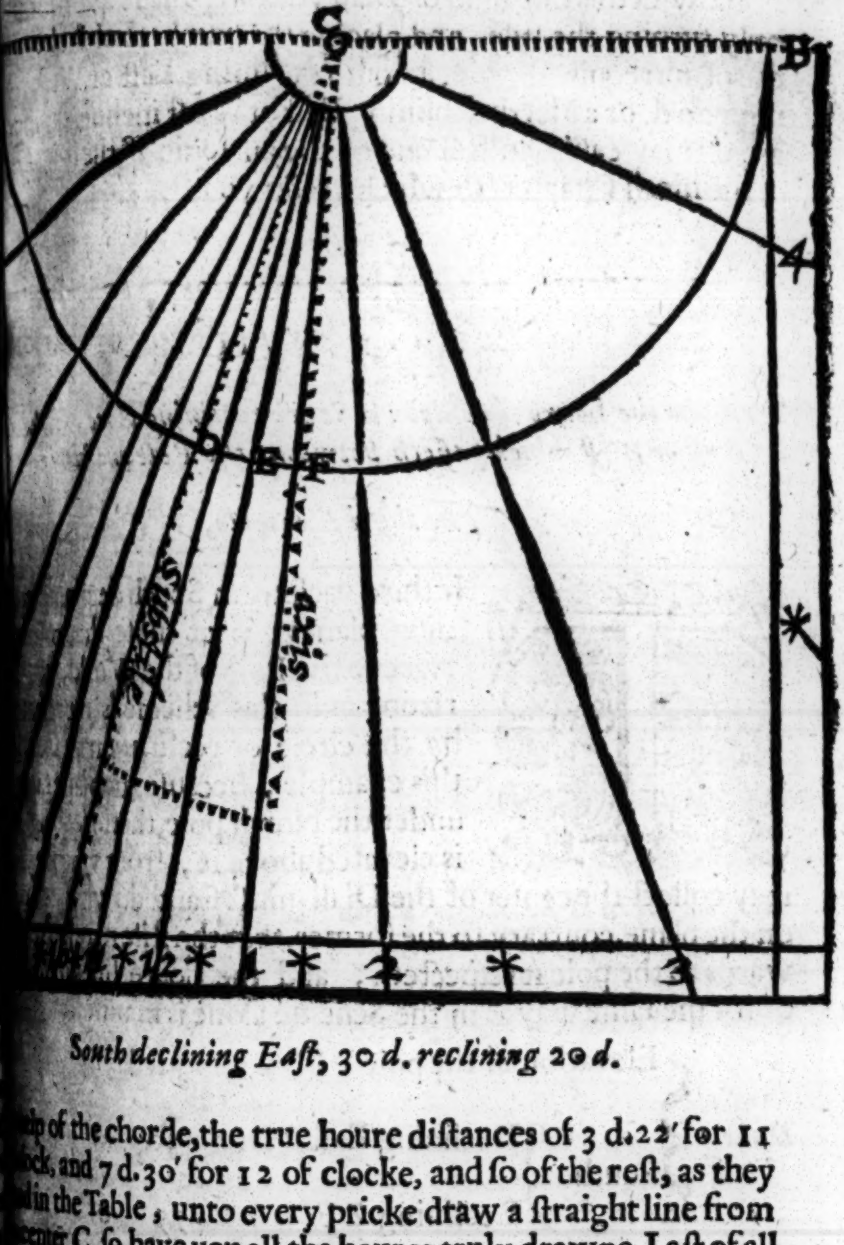
			Logar.
As the sine of P R S	90 d.	0'	10000.00
Is to the tangent of R P S	76	8	10607.55
So is the sine of the side P R	13	49	9378.06
To the tangent of the side R S	44	3	9983.61

And so proceed with all the rest.

The true houre distances upon the plane being thus fo[und] you may easily make the Diall in this manner,

The Geometricall projection.

First draw the horizontall line A C B in the uppe[r part of] the plane, because the stile of this Diall must looke dow[ne] to the South pole, and this line in all recliners will be p[arallel] to the base representing A C B of the scheme. Vpon any p[oint of] this line, as at C, make the circle A D B (with 60 d. of [the] chord) representing the reclining circle of the scheme A[...] and because this plane declineth East, the substile and [the] morning houres must stand on the West side of the Meri[dian] as the great scheme of the 15 Chapter doth demonstrate: [f]or suppose P to be the South pole, and the next side of the rec[lining] flat A H B to the pole, to be the South side thereof, but th[e par]ticular scheme will better direct you to reckon the di[stance of] the Meridian and horizon in the Diall, from A the W[est] [...] the horizontall line, as B standeth from S in the scheme: [that] the substile may stand to the Westwards of the Meridian[...] complement of that distance to 180 d. from B, the Ea[st ...] of the Diall, both which will bring the 12 of clocke hou[re to] the due place, agreeable with the scheme, *viz.* A E to B O, E D to R O, therefore by helpe of the chord set of the dist[ance] of the Meridian and horizon 78 d. 50' from A to E, and [draw] the line C E 12, for the 12 of clock houre, from E reck[on ...] 30' the distance of the substile and Meridian Westward[s, as D] standeth from O in the scheme, and draw the prickt line C[D] for the substile, from the point D of the substile set of either [...]



South declining East, 30 d. reclining 20 d.

lp of the chorde, the true houre distances of 3 d.22′ for 11
ock, and 7 d.30′ for 12 of clocke, and so of the rest, as they
d in the Table, unto every pricke draw a straight line from
center C, so have you all the houres truly drawne. Last of all
F from D the heighth of the stile D F 13 d. 49′, and draw
ne C F for the axis, which directed directly over the sub-
C D, the Diall is perfected for use, but must be placed in its
position by the declination and reclination thereof.

Now

Now in this one kind of Diall you have made 4 (as fores[aid]) only turning the stile, and placing the numbers of the hour[s] the plane requireth, *viz.* a South declining East or West, [recli]ning 20 d. or a North declining East or West inclining as m[uch] as you may easily collect out of the analogie of the foure [...] of the ninth Chapter, to which I refer you.

CHAP. XVII.

To draw the houre lines upon a South reclining plane, declin[ing] East or West which passeth betweene the Pole and Horizon.

The third Example.

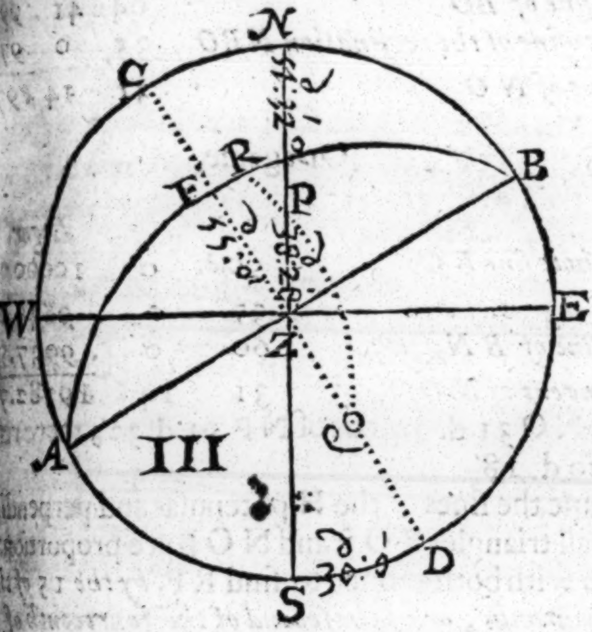
THe third varietie in South declining recli-ning planes, is of those that passe be-tweene the Pole of the World, and Ho-rizon, as in this Scheme is represen[ted] by the circle of reclination A F B, [in] this example, because the plane is [...] under the North pole, therfore that p[ole] is elevated above it, from whence yo[u] may collect the center of the Diall must stand downward[s] on the plane, contrary to the former, that the stile may look to-wards to the pole it respecteth, and the houre lines must point the same way as in the Scheme alone is manifest.

Data	Elevation of the pole P N		51 d. 32′	
	South	Declining East S D	30	0
		Reclining Z F	55	0

Quæsita
1 the distance of the Merid. & horizon O B 64 [...]
2 the heighth of the stile PR ——————— 19 [...]
3 the distance of the substile & Merid. R O 6 [...]
4 the angle between the two Merid. R P O 17 [...]

The Demonstration.

...w the same foure things, that you found for the former ... must also be sought for this, before you can calculate the ...res, viz. First, the distance of the Meridian and Horizon ...on the plane O B. Secondly, the heighth of the pole or stile ...ove the plane P R. Thirdly, the distance of the substile and



...Meridian R O, and lastly, the angle betweene the two Meridi-...ans Z P Q, or the verticall R P O; all which doe plainly appeare ...in the particular scheme adjoyning, the first whereof O B is ...found by *the first varietie of the fift case of R. S. triangles*: for in ...the quadrantall Z C N.

The Arithmeticall calculation.

			Logar.
As the whole sine Z C	90^d	0'	10000.00
Is to the sine of the reclination F Z	55	0	9913.36
So is the tangent of the declination C N	30	0	9761.44
To the tangent of F O	25	19	19674.80

O Whose

Whose complement is O B 64 d. 41′, the distance of Meridian and Horizon.

2 In the triangle B N O you must seeke the side NO, by first of the first case of R.S triangles, or in the quadrantall B by the first of the fift case. For

			Logar.
As the sine of B N O	90 d.	0′	10000.00
Is to the sine of BO	64	41	9956.15
So is the cosine of the reclination NBO	35	0	9758.59
To the sine of N O	31	14	19714.74

Or againe,

			Logar.
As the whole sine B C	90 d.	0′	10000.00
Is to the tangent of F C	35	0	9845.33
So is the sine of B N	60	0	9937.53
To the tangent of N O	31	14	19782.76

Take N O 31 d. 14′ out of N P 51 d. 32′, there resteth P O 20 d. 18′

3 Because the sines of the Hypotenusas and perpendiculars the verticall triangles R O P and N O B are proportionall, may deale with both at once to find R P, *by the 15 of the fo of Regiomontanus, or by the second of the fourteenth of Fin* For

			Logar.
As the sine of the Hypotenusa B O	64 d.	41′	0043.84
Is to the sine of the Hypotenusa P O	20	18	9540.25
So is the sine of the perpendicular N B	60	0	9937.53
To the sine of the perpendicular R P	19	25	19521.62

Therefore R P 19 d. 25′ is the heighth of the pole of the above the plane.

4 In the triangle R P O seeke the side R O, *by the first of the third case of R.S. triangles*. For

			Logar.
the cosine of R P	19 d.	25′	9974.57
the sine of P R O	90	0	10000.00
the cosine of P O	20	18	9972.15
the cosine of R O	6	2	9997.58

Or if you will by the ſame verticall triangles, and ſecond [illegible]ome of *Pitiſcus*.

			Logar.
the tang. of the perpẽdicular NB	60 d.	0′	9761.43. *Ar. cõpl.*
to the sine of the baſe N O	31	14	9714.77
is the tang. of the perpẽdicular RP	19	25	9547.14
to the sine of the baſe R O	6	2	9023.34

The diſtance of the ſubſtile from the Meridian.

5 Laſtly, in the ſame triangle R P O ſeeke the angle at P, *by* [the] *firſt of the fift caſe of R. S. triangles.* For

			Logar.
As the sine of the ſide P O	20 d.	18′	9540.25
to the sine of the angle P R O	90	0	10000.00
so the sine of the ſide R O	6	2	9021.63
To the sine of the angle R P O	17	38	9481.38

Therefore 17 d. 38′ is the angle R P O betweene the two Meridians equall to Z P Q, becauſe they are verticals.

Houres and parts from the substile.		Equinoctiall distances.	Logarithmes of tangents.	Houre arches on the plane.	Differ.
		d '		d '	d '
11	1	2.38	8184.30	0.53	
.	½	10. 8	8773.81	3.24	2.31
12	12	17.38	9023.85	6. 2	2.38
.	½	25. 8	9192.92	8.52	2.50
1	11	32.38	9328.03	12. 1	3. 9
.	½	40. 8	9447.48	15.39	3.38
2	10	47.38	9561.59	20. 1	4.22
.	½	55. 8	9678.54	25.30	5.29
3	9	62.38	9807.61	32.42	7.12
.	½	70. 8	9963.70	42.37	9.55
4	8	77.38	10180.67	56.35	13.58
.	½	85. 8	10591.46	75.38	19. 3

Houres and parts from the substile.		Equinoctiall distances.	Logarithmes of tangents.	Houre arches on the plane.	Differ.
		d '		d '	d '
.	½	4 52	8451.77	1. 37	
10	2	12.22	8862.56	4. 10	2.33
.	½	19.52	9079.53	6. 51	2.41
9	3	27.22	9235.62	9. 46	2.55
.	½	34.52	9364.69	13. 2	3.16
8	4	42.22	9481.64	16.52	3.50
.	½	49.52	9595.79	21.31	4.39
7	5	57.22	9715.20	27.26	5.55
.	½	64.52	9850.31	35.19	7.53
6	6	72.22	10019.38	46.17	10.58
.	½	79.52	10269.43	61.44	15.27
5	7	87.22	10858.93	82. 7	20.23

These things being found, first make the Table for the houres heretofore directed, considering, that because the angle betweene the Meridians is greater then one houres Equinoctiall distance from 12, and lesse then two, therefore the substile (from whence the other houres distances are to be set) must fall betweene 11 and 10 of clocke (for the reasons heretofore alleaged) viz. 2 d. 38′ from 11 houres, as by substraction of 15 d. the Equinoctiall distance thereof out of 17 d. 38′, and 4 d. 52′ from 10 houres ½, as by substraction of 17 d. 38′, out of 22 d. 30′, the Equinoctiall distance of 10 ho. ½ doth appeare, wherefore begin the table at 11 of clocke, and end it with 10 ½: unto 2 d. 38′, the Equinoctiall distance of 11 houres from the substile, adde 7 d. 30′. so oft as you can under 90 d. and unto 4 d. 52′ for 10 ho: ½ doe the like, so shall you haue the Equinoctiall distances of all the other houres and halfes, the Logarithmeticall tangents whereof being continually added to the Log. sine of 19 d. 25′, the heighth of the stile P R (first transcribed into a paper) shall give you new Logarithmeticall tangents, whose arches are the true houre distances upon the plane, represented by the circle A E R B, for *by the first of the fift case of R.S. Triangles*, the two triangles 11 P R, and 5 P R of the greater Scheme of the 15 Chapter, comprehending 90 d. in the Æquator may be resolved together.

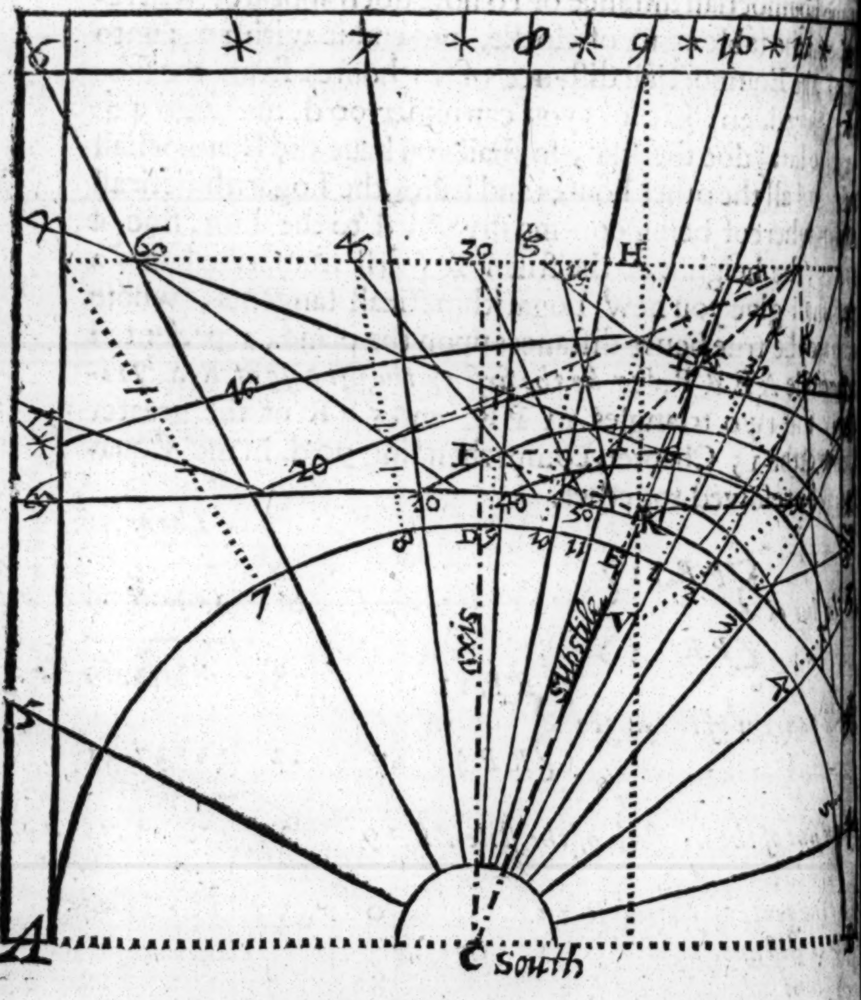
		d.	′	*Logar.*
As the sine of	*P R* 11 / *P R* 5	90 *d.*	0′	10000.00
Is to the tangent of the angle	*R P* 11	2	38	8662.69
	or			
	R P 5	87	22	11337.31
So is the sine of the heighth of the stile P R		19	25	9521.71
To the tangents of each houres distance upon the plane	*R* 11	0	53	18184.40
	or			
	R 5	82	7	18859.02

Wherefore (as the Table sheweth) the first houre R 11 is di-

stant from the substile 0 d. 53′, and R 5 six houres distant from e-leven is 82 d. 7′, So is R 12. 6 d. 2′. R 10. 4 d. 10′, R 1. 12 d. 1′, R 9. 9 d. 46′, and so of the rest.

The Geometricall projection.

The Table being prepared, and the houres distances calculated, draw the Horizontall line A C B, paralell to the base re-



South declining East 30 *d.*
Reclining 55 *d.*

pre-

presenting A Z B of the Scheme, towards the lower part of the line, because the center must stand downwards, and the stile and houres point upwards to the pole, as appeares by the very inspection of the Scheme. In any part of this Horizontall line, as at C, place the center, and with the length of 60 degrees of the chord, draw the arch A D E B, representing the reclining circle A F O B of the Scheme. In this arch place the Meridian, substile, and houres, as they lie in the Scheme, and you cannot doe amisse, *viz.* from B the Easter part of the Horizontall line of the Diall, set off by helpe of the chorde unto 1, B O of the Scheme 64 d. 41′, the distance of the Meridian from the Horizon, and draw C V I 2, for the 12 of clocke houre from the line of 12 unto E reckon O R of the Scheme 6 d. 2′ the distance of the substile from the Meridian, which set of Westwards, agreeable to the Scheme, because the declination is Eastwards, and draw the prickt line C E for the substile, from the point E both wayes set of by helpe of the chord, the houre distances of 10. 9. 8. 7. 6. 5. to the Westward therof, & 11. 12. 1. 2. 3. 4. to the Eastward for the rest of the houres (as you may see them lie in the greater Scheme of the 15 Chapter) and to each pricke draw straight lines from the center, so is the Diall finished for use. Last of all, set of the heighth of the stile P R 19 d. 25′ from E to D, and draw the line C D representing the axis, which being erected perpendicularly over the substile line C E, the base A C B declining 30 d. Eastwards, and the whole plane at 6. 12 raised to an angle of 35 d. above the Horizon, will shadow the true houre lines upon the plane, and so you have done with the three varieties of South declining reclining Dials. Wherein also note that having made this one Diall (or any of the like) you have at once made foure, changing but the position of the Dials, and altering the numbers of the houres, as the plane doth require, for first this answereth to the opposite the North declining 30 d. West, and inclining to the Horizon the Complement of the reclination 35 d. also the South declining 30 d. West reclining 55 d. or to his opposite North declining East 30 d. and inclining to the Horizon 35 d. which because they are by the example of the ninth Chapter easily deduced one out of the other, I

 shall

ſhall not need to ſpend more time about them, yet this one thing more may be obſerved, that for variety ſake, and ſome eaſe alſo in the Worke, if you take O P the arch of the Meridian betweene the pole and the plane, in the laſt Diagram 20 d. 17′ for the latitude, and the angle N O B, or P O R betweene the Meridian and the plane 73 d. 20′ for the reclination, you may reduce this declining reclining plane, or any other after the ſame manner, into an Eaſt or Weſt reclining plane, unto which Diall being made, it ſhall give the ſame houre lines that the former hath done, as may eaſily be tried by the rules of the 12 Chapter, yeelding the ſame elevation of the ſtile 19 d. 25′. the ſame diſtance of the ſubſtile and Meridian 6 d. 2′, and the ſame angle between the Meridians 17 d. 38′, which by the ſeverall Schemes will at the firſt ſight plainly appeare.

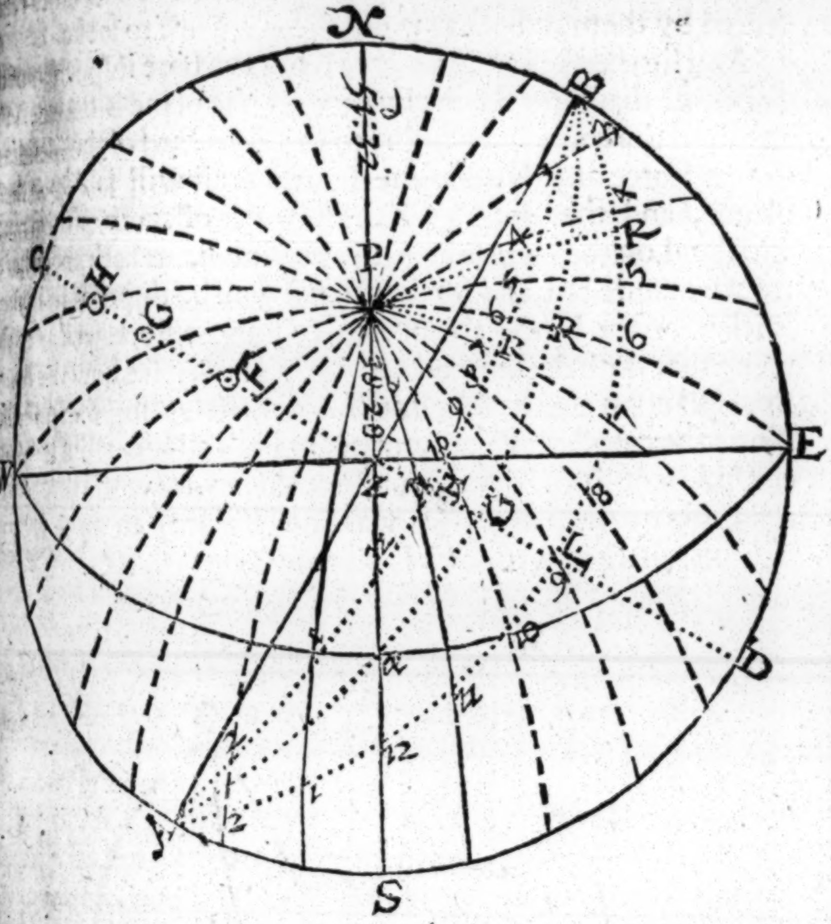
CHAP. XVIII.

To draw the houre lines upon the polar plane declining Eaſt or Weſt, being the firſt variety of North declining reclining planes.

AS in the ſouth reclining decliners there are three varieties, ſo are there in the North as many: for either the plane reclining doth paſſe by the interſection of the Meridian & Æquator, and then it is called a declining polar, which hath the ſubſtile alwayes perpendicular to the Meridian, or elſe it paſſeth above or under the interſection of the Meridian and Æquator, which ſomewhat differeth from the former. I will therefore firſt ſhew how they lie in the Scheme, and then proceed to the particular making of the Dials proper to each of them.

The Demonſtration.

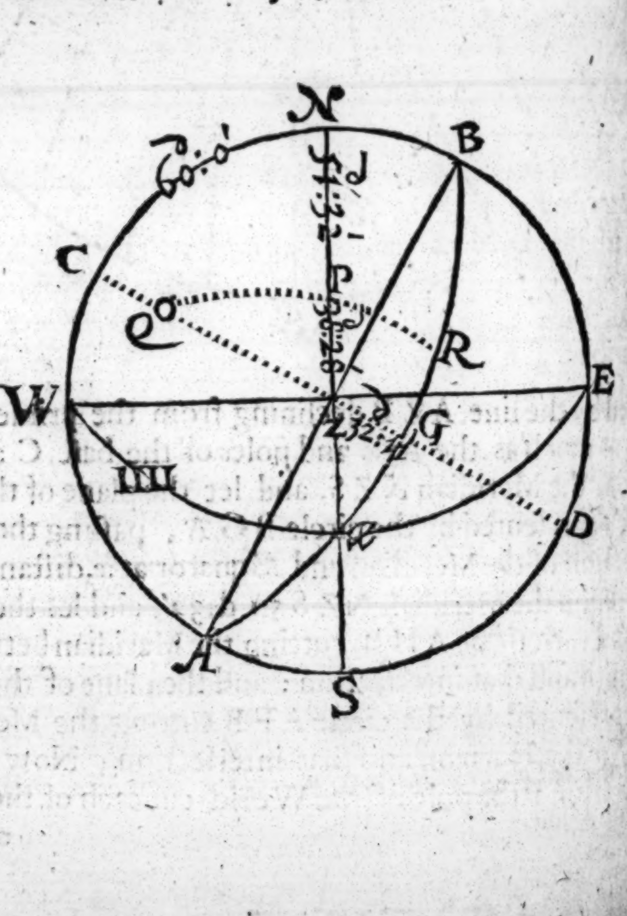
Let the North declining baſe in the Scheme adjoyning be repre-



represented by the line A Z B declining from the prime verticall W E, as much as the Axis and poles of the base C and D decline from the Meridian N Z S, and let the plane of the first varietie be represented by the circle B G A, passing thorough the intersection of the Meridian and Æquator at æ, distant from the Zenith upon the Meridian N Z S 51 d. 32′, and let the plane of the second varietie be A H B, cutting the Meridian betweene z the Zenith and that intersection, and the plane of the third varietie represented by the circle A F B cutting the Meridian betweene S æ the Horizon and that intersection; Now as the houre lines from P the pole of the World cut each of those reclining

clining circles, so will they fall upon the severall planes repre-
sented by them, whose true distances we are to seeke.

And further you may observe from the bare inspection of the Scheme, that now the declination of the plane is become Westerly, all the houre lines runne to the Eastward of the Meridian, so that scarce any fourenoone houres at all will fall upon the planes, and therefore that the substiles of every of them must also stand on the same side of the Meridian, as hath beene heretofore manifested, and further that if you be disposed to make a Diall upon the base of the plane, declining only, as well as to the plane that doth decline and recline, you may see how the houre lines fall upon the streight line B Z A representing the same, and frame the calculation and worke, as in decliners: But to avoid confusion of lines, it will not be amisse to draw the three severall Cases by themselves (as was done before) in three severall Schemes marked with IIII, V, and VI.



Data	Elevation of the pole P N		51 d. 32′.
	North	Declining West N C	60 d. 0.
		Reclining Z G	32 11.
Quæsita	1 distance of Meridian and Horizon A æ		47 d. 18′
	2 heighth of the Pole or Stile P R		42. 52

The first Scheme representeth the declining reclining plane, passing by the intersection of the Meridian and Æquator, Z G being the reclination 32 d. 11′, and Z æ the distance of the Equinoctiall from the Zenith 51 d. 32′. The second sort cutteth the Meridian at O betweene the Zenith and Æquator, as doth the circle B H A representing the plane in the Diagram of the next Chapter marked with V. The third sort cutteth the Meridian also at O betweene the Horizon and Æquator, as doth the circle B F A representing the plane in the Diagram of the 20 Chapter marked with V I.

From C in each Diagram upon the line C Z D, representing the Azimuth, crossing the planes at right angles, set of the quantitie of each severall reclination, so shall you have points at Q, representing the poles of each reclining plane, so much raised above the Horizon N E S W, as the reclining planes are falne from the Zenith Z, from which points at Q you must draw the arches of great circles (whose centers or poles will be alwayes in the periphery of the planes) passing thorough the pole of the World P, and crossing the reclining planes at right angles in R, and these represent the Substiles, or Meridians of the planes, as the lines N P, Z S doe the Meridians of the place, and PR in each of them giveth the heighth of the pole or stile above the plane, and R æ, R O, the distance of the substile and Meridian, A æ A O the distance between the Meridian and Horizon, and æ PR, O P R the angle betweene the two Meridians, all which foure things must be found as in the former declining reclining they were, before you can proceed to calculate the houre distances or frame your Diall.

And

And here alſo as in the 14 Chapter, there may be a recli-tion found to any declination given, and contrary, by which fit the plane howſoever declining, to paſſe thorough the inter-ection of the Meridian and Æquator, whoſe ſtile is alwayes perpendicular to the Meridian, therefore in the triangle Z G or rather in the quadrantall A D G, let S D the declination given, and S æ the complement of the elevation, or heighth of the Equinoctiall above the Horizon, to find D G, whoſe comple-ment is G Z the reclination deſired, *by the ſecond of the ſixt of R. S. Triangles.* For

			Loga.
As the ſine of A S the complement of the declination	30^{d}	0'	9698,97
Is to the tangent of S æ, the comple. of the eleva.	38	28	9900.09
So is the whole ſine A D	90	0.	10000.00
To the tangent of D G	57	49	10201.12

Therefore G Z the complement thereof 32 d. 11'. the recli-nation deſired, the contrary part is performed by the converſe of this: for

			Logar.
As the tangent of G D	57^{d}.	49'	10201.12
Is to the tangent of æ S	38	28	9900.09
So is the whole ſine D A	90	0	10000.00
To the ſine of S A	30	0	9698.97

Whoſe complement S D is 60 d. the declination deſired.

The Arithmeticall Calculation.

Now therefore for the declining polar, that is, whoſe recli-ning plane paſſeth by the interſection of the Equinoctiall and Meridian (as in the firſt Diagram) you muſt ſeeke A æ, the di-ſtance of the Meridian N Z S from A the point of the Horizon by which the reclining plane paſſeth, which may be found by three ſeverall Triangles, either A S æ, or the verticall Z G æ, or the quadrantall S Z D.

In the firſt you have A S 30 d. 0', and S æ 36 d. 28', and the right

right angle at S; to find the base A æ, *by the ninth Case of R.S. Triangles.*

In the second you have the base Z æ 51 d. 32′ and Z G 32 d. 11′, and the right angle at G; to find the side G æ, *by the second of the third Case of R.S. Triangles.*

Or lastly in the quadrantall S Z D you have the angle Z 60 d. whose measure is D S the declination, and you have Z G 32 d. 11′ the reclination, and the quadrantall Z D 90 d. to find G æ, whose Complement is A æ *by the first of the fift case of R.S. Triangles, the thing desired.* For

			Logar.
1 *As the whole sine Z D*	90 d.	0′.	10000.00
Is to the tangent of D S	60	0	10238.56
So is the sine of the side Z G	32	11	9726.42
To the tangent of G æ	42	42	9964.98

Whose Complement 47 d. 18′. is A æ the distance of the Meridian from the Horizon.

2 In the quadrantall æ R P, you must find R P, which is the heighth of the pole above the plane, *by the first of the sixteenth Case of R.S. Triangles.* For

			Logar.
As the sine of æ G	42 d.	42′	9831.33
Is to the whole sine æ R	90	0	10000.00
So is the tangent of G Z	32	11	9798.87
To the tangent of R P	42	52	9967.54

Or againe in the same triangle, *by the first of the fifteenth case.*

			Logar.
As the sine of æ Z	51 d.	32′.	9893.74
Is to the whole sine æ P	90	0	10000.00
So is the sine of Z G	32	11	9726.42
To the sine of P R	42	52	9832.68

3 Because in all decliners (whose planes passe by the inter-

ſection of the Meridian and Equinoctiall) the ſubſtile is perpen-dicular to the Meridian, therefore you need not ſeeke æ R distance betweene the Subſtile and Meridian, which is alwayes 90 d. falling upon the 6 of clock houre.

4. Laſtly, the arch æ R which is the diſtance of the ſubſtile from the Meridian being 90 d. the angle at P oppoſite thereto must be alſo 90 d, from whence it followeth, that every two houres equidiſtant from the 6 of clocke houre in Equinoctiall degrees ſhall alſo have the like diſtance of degrees in their arches upon the plane, and ſo one halfe of the Diall calculated ſerves for all, as you may ſee in the Table adjoyning.

Houres and parts from the ſubſtile.		Equino-ctiall di-ſtances.	Logarithmes of tangents.	The houre arches on the plane.	Differ.
		d ′		d ′	d ′
6	6	0. 0	*Subſtile.*		
·	½	7.30	8952.12	5. 7	5. 13
5	7	15. 0	9260.74	10. 20	5. 24
·	½	22.30	9449.91	15.44	5. 43
4	8	30. 0	9594.14	21. 27	6. 7
·	½	37.30	9717.67	27. 34	6. 40

Houres and parts from the ſubſtile.		Equino-ctiall di-ſtances.	Logarithmes of tangents.	The houre arches on the plane.	Differ.
		d ′		d ′	d ′
3	9	45. 0	9832.69	34. 14	7 20
·	½	52.30	9947.71	41. 34	8 7
2	10	60. 0	10071.25	49. 41	8 59
·	½	67.30	10215.46	58. 40	9 50
1	11	75. 0	10404.64	68. 30	10.33
·	½	82.30	10713.26	79. 3	10.57
12	12	90. 0		90. 0	

Wherein the Substile is supposed to stand upon the 6 of clock ..., being 90 d. distant from 12, therefore place all the rest ... houres, as they are equidistant from 6 together, *viz.* 5 H. ... 7 H, 4 H. and 8 H. 3 H. and 9 H. &c. and set unto them ... Equinoctiall distances; unto the Logarithmeticall tangents thereof adding the Logarithmeticall sine of the heighth of the Pole or stile PR above the plane which is 42 d. 52′ Logar. 9832. 68 (first transcribed into a loose paper) you produce new Log: tangents, *by the first of the fift Case of R. S. triangles*: whose arches are to be set of by helpe of the chorde both wayes from the Substile as hath been often shewed, for

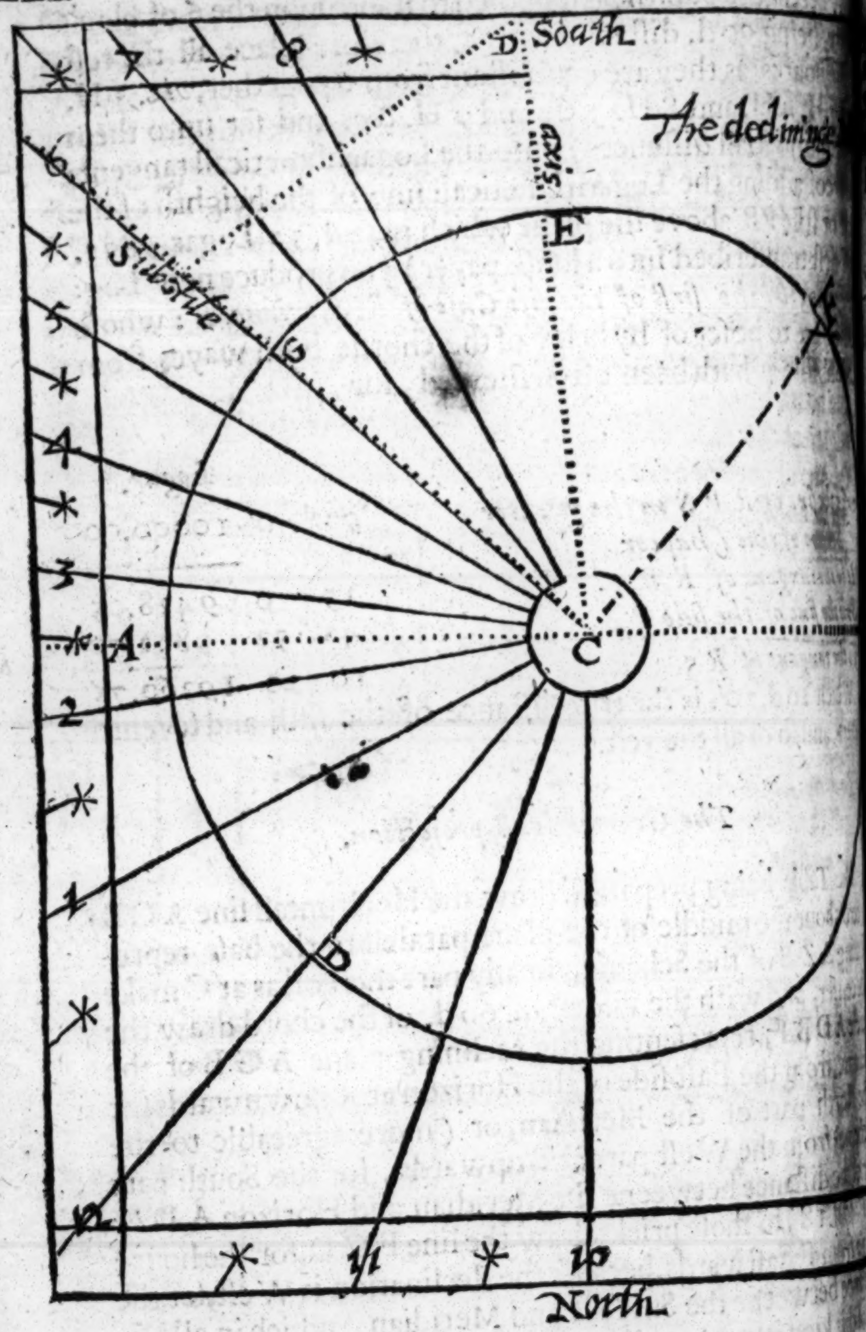
			Logar.
As the sine of R P S in the greater Scheme of this Chapter	90 d.	0′	10000.00
Is to the tangent of R P 5	15	0	9428.05
So is the sine of the side P R	42	52	9832.70
To the tangent of R 5	10	20	19260.75

Which 10 d. 20′. is the true distance of the fifth and seventh houre, and so of all the rest.

The Geometricall projection.

The Table being prepared, draw the Horizontall line A C B neere about the middle of the plane paralell to the base representing A Z B of the Scheme, in any part thereof, as at C make the center, and with the widest of 60 d. of the chord draw the circle A D B F, representing the reclining plane A G B of the Scheme, from the East side of the Horizon at A downwards for the North part of the Meridian, or (more agreeable to the Scheme) from the West part at B upwards, for the South part set of the distance betweene the Meridian and Horizon A D or B F 47 d. 18′, to those pricks draw the line F C D, for the houre of 12 from F Eastwards, because the declination is West, set the distance betweene the Substile and Meridian, which in all Dials of this kind is 90 d. and therefore falleth upon the houre of 6

per-



North declining West 60. d. reclining 32 d. 11'.

pendicular to the Meridian, & agreeable to the Scheme, in the things desired, *viz.* B F to A æ, F G to æ R, & C F to Z æ, the South part of the Meridian, falling betweene the West part of the Horizon and Substile. Now at the distance of 90 d. draw the line C G 6 for the houre of 6 and Substile, set of from G each wayes (by helpe of the chorde) upon the circle E G A D the houre distances, as you find them in the Table, *viz.* for the houres of 5 and 7, 10 d. 20'. for 4 and 8, 21 d. 27', and so of the rest (but past 8 you need adde none) so shall you have prickes, unto which streight lines being drawne from the Center, the true houre lines are given. Lastly, from G either way set of the heighth of the stile G E 42 d. 52', and draw the line C E for the Axis of the World, which being erected perpendicularly over the Substile C G 6, the Diall is prepared for use, and must be rectified by the declination and reclination proper to the same.

CHAP. XIX.

To draw the houre lines upon a North reclining plane, declining East or West, which cutteth the Meridian betwixt the Zenith and Equinoctiall.

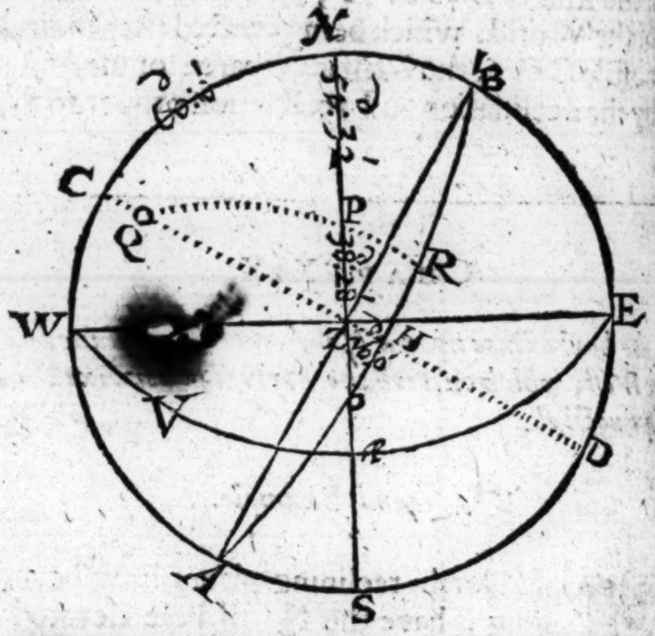
The second Example.

ALL North reclining planes howsoever declining, have the North Pole elevated above them, and therefore the center of the Diall must be so placed upon the plane, that the stile may looke upwards to the Pole, neither can it be expected that the plane being elevated above the Horizon Southward, should at all times of the yeare be enlightned by the Sunne, except it recline so farre from the Zenith as to intersect the Merdian betweene the Tropique of ♋ and Horizon, this plane therefore reclining but 16 d. from the Zenith, and declining 60 d. cannot shew many houres, when the

the ☉ is in his greatest Northerne declination, partly by reason of the heighth of the plane above the Horizon, and partly by reason of the great declination thereof, hiding the ☉ beams from all the Morning houres, which may therefore be left out as uselesse.

The Demonstration.

In this second varietie, the plane represented by the Circle B H A cutteth the Meridian at O betweene the Zenith and Æquator, Z H being the reclination 16 d. and Z æ the distance of the Æquator from the Zenith 51 d. 32′. as aforesaid.



Data
Elevation of the pole P N 51 d. 32′.
North Declining West N C 60 0
North Reclining Z H 16 0

Quæsita
1 the distance of the Merid. & horizon A O 64 d. 37
2 the heighth of the stile P R ———— 30 55
3 the distance of the substile & Merid. O R 64 26
4 the angle between the two Merid. O P R 76 10

As

As in the former so in this Diall the same foure things are a-
bove to be found before you can calculate the houre distances.
Tened. The first is A O in the Scheme adjoyning, which is the
distance of the Meridian from the Horizon. The second is P R
the elevation of the stile or pole above the plane A O R B, the
third is O R the distance of the Substile or Meridian of the plane
P R from the Meridian of the place N P S. And lastly, the angle
O P R betweene the two Meridians aforesaid.

The Arithmeticall calculation.

You may find the distance A O betweene the Meridian and Horizon by three severall triangles, as in the former, but because you may use the same worke in all three varieties, therefore in the quadrantall Z S D you have Z H the reclination given 16 d. 0', and Z D the radius 90 d. and D S equall to C N the declination 60 d. to find H O, whose complement is A O desired, *by the second of the fift Case of R. S. Triangles.* For

			Logar.
1 *As the whole sine Z D*	90 d.	0'	10000.00
Is to the sine of the reclination Z H	16	0	9440.34
So is the tangent of the declination D S	60	0	10238.56
To the tangent of H O	25	31	9678.90

Whose complement A O 64 d. 29'. is the distance of the Meridian and Horizon.

2 In the same triangle you may first find out Z O *by the second of the eighth Case of R. S. Triangles.* For

			Logar.
As the sine of the declination D S	60 d.	0'	9937.53
Is to the whole sine S Z	90	0	10000.00
So is the sine of the side H O	25	31	9634.25
To the sine of the side Z O	29	50	9696.72

Vnto

Vnto Z O 29 d. 50'. adde P Z 38 d. 28'. so have you the who[le] side P O 68 d. 18'.

3 In the triangles O Z H and O P R you may find o[ut] *by the* 15. *of the fourth of* Regiomontanus, *or the second* [of the] *fourth of Finkius*, because the sines of the Hypotenusas an[d per-]pendiculars are evermore proportionall each to other. For

			Logar.
As the sine of the hypotenusa O Z	29 d.	50'	0303.22. Ar. comp.
Is to the sine of the perpendicu. Z H	16.	0.	9440.34.
So is the sine of the hypotenusa O P	68.	18.	9968.07.
To the sine of the perpendicu. P R	30.	59.	19711.63.

Or if you will in the verticall Triangles A O S and POR by the same axiomes.

			Logar.
As the sine of O A	64 d.	29'	0044.58 ar.
Is to the sine of S A	30	0	9698.97
So is the sine of O R	68	18	9968.07
To the sine of P R	30	59	19711.62

Which 30 d. 59'. is the heighth of the stile or pole above the plane.

4 In the same triangles, you may finde R O by the second Axiome of the fourth of *Pitiscus*, because the sines of the base and tangents of the perpendiculars are likewise proportionall each to other.

			Logar.
As the tang. of the perpendicular Z H	16 d.	0'.	10542.51 ar. s.
Is to the sine of the base H O	25	31	9634.25.
So is the tangent of the perpendicu. P R	30	59	9778.49.
To the sine of the base R O	64	26	29955.25.

Or in the same verticall triangles.

			Logar.
As the tangent of S A	30 d.	0'.	10238.55
Is to the sine of S O	60	10	9938.26
So is the tangent of P R	30	59	9778.48
To the sine of R O	64	26	29955.29

Which 64 d. 26'. is the distance of the Substile from the Meridian N Z S.

5. Lastly, in the same triangle you may find the angle P, *by the second of the* 14, 15, *or* 16 *cases of R. S. Triangles*. For

			Logar.
As the sine of P R	30 d.	59'	9711.63
Is to the sine of P R O	90	0	10000.00
So is the tangent of R O	64	26	10320.20
To the tangent of R P O	76	10	10608.57

Which 76 d. 10'. is the angle O P R betweene the two Meridians, by helpe whereof wee proceed to calculate the houre distances as followeth.

Now then you may conclude (as in the former) because the angle betweene the two Meridians is 76 d. 10'. and that 75 d. is 5 houres distant from the Meridian, the substile from whence you set all the true houre distances must fall betweene 7 and 6 of clocke, reckoned from the South, which in this example is 12 at midnight, and that of the afternoon houres, because the plane declineth so farre Westerly, and is elevated so high above the Horizon, that the Sunne is on the inclining or backe side of the plane all the forenoone; begin therefore the Table at 7 of clock, and end it at 6½, as in the example.

Houres and parts from the substile.		Equinoctiall distances.	Logarithmes of tangents.	The houre arches on the plane.	Differ.
		d '		d '	d '
7	5	1.10	8020.51	0.36	
.	½	8.40	8894.69	4.29	3.53
8	4	16.10	9173.87	8.29	4. 0
.	½	23.40	9353.38	12.43	4.14
9	3	31.10	9493.26	17.18	4.35
.	½	38.40	9614.83	22.23	5. 5
10	2	46.10	9729.32	28.12	5.49
.	½	53.40	9845.06	34.59	6.47
11	1	61.10	9970.86	43. 5	8. 6
.	½	68.40	10119.95	52.49	9.44
12	12	76.10	10320.27	64.26	11.37
.	½	83.40	10666.35	77.50	13.24

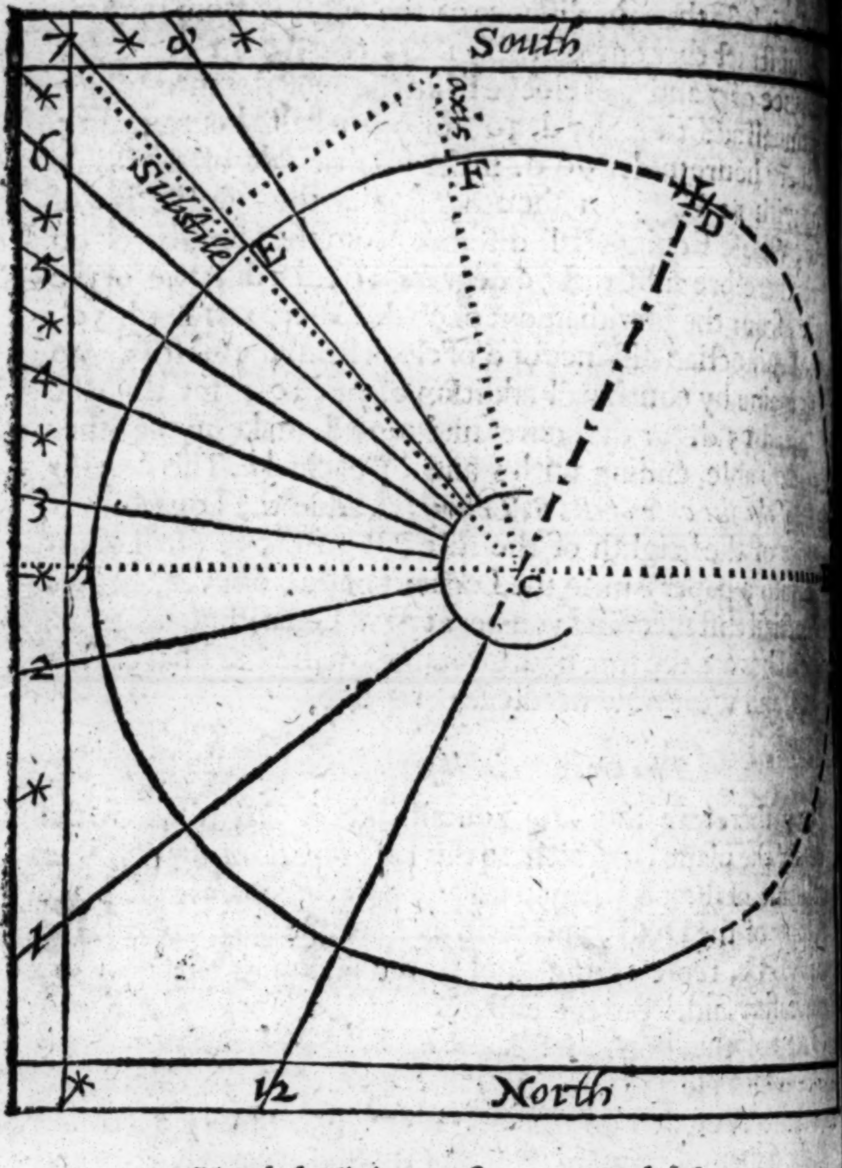
Houres and parts from the substile.		Equinoctiall distances.	Logarithmes of tangents.	The houre arches on the plane.	Differ.
		d '		d '	d '
.	½	6 20	8756.91	3.16	
6	6	13.50	9102.99	7.13	3.57
.	½	21.20	9303.31	11.22	4. 9
5	7	28.50	9452.40	15.49	4.27
.	½	36.20	9578.19	20.44	4.55
4	8	43.50	9693.93	26.18	5.34
.	½	51.20	9808.43	32.45	6.27
3	9	58.50	9930.00	40.24	7.39
.	½	66.20	10069.88	49.35	9.11
2	10	73.50	10249.39	60.37	11. 2
.	½	81.20	10528.57	73.30	12.53
1	11	88.50	11402.74	87.44	14.14

Where-

Wherein because 75 d. the Equinoctiall distance of 7 and 5 clocke is lesse then the distance of the Substile from the Meridian, substract that out of this, there remaynes 1 d. 10′. for the distance of 7 and 5 of clocke from the Substile: unto which continuall addition of 7 d. 30′. for every halfe houre, and 15 for every houre under 90 d. make up that side of the Table ending with 12 H. $\frac{1}{2}$, on the other side of the substile is 6 of clocke, whose Equinoctiall distance from the Meridian is 90 degrees therefore substract 76 degrees 10′. the distance of the substile, from the Meridian out of 90 d. so have you 13. d. 50′. for the Equinoctiall distance of 6 of clock from the substile, unto which againe by continuall addition of 7 d. 30′, for the halfe houres, and 15 d. for the houres under 90 d. make up the other side of the Table, ending with 1 and 11 of clocke. This done *by the first of the fift case of R. S. Triangles*, adde the Logarithmeticall sine of the heighth of the stile P R 30 d. 59′. (first transcribed into a paper) unto the Logar: tangent of every houres Equinoctiall distance, and you beget new Logarithm: tangents, whose arches are the true houre distances desired, as I have often shewed, and were now needlesse to repeate.

The Geometricall projection.

Draw therefore the Horizontall line A C B towards the middle of the plane, paralell to the base representing A Z B of the Scheme of the 18 Chapter: in any part thereof, as at C place the center of the Diall, and with 60 d. of the chorde make the circle A B D, representing A H B the reclining plane in the Scheme aforesaid, from the East point of the Horizontall line A (by helpe of the chorde) set A 12. 64 d. 29′, the distance of the Meridian and Horizon, for the North part of the Meridian, but from B the West part of the Horizontall line (more agreeable with the Scheme) upwards to D for the South part thereof, and draw the line D C 12, for the 12 of clocke houre: from D to E set 64 d. 26′, the distance betweene the Substile and Meridian Eastward from it, and draw the prickt line C E for the Substile; so shall B D of the Diall agree with A O of the Scheme, D E with O R, and C D the houre of 12 fall betweene them, as doth Z O S the Meridian in the Scheme. From the point E of the sub-



North declining West 60 d. 0'.
Reclining 16. 0.

substile (by helpe of the chord) set the true houre distances both wayes upon the circle A B D, as you find them in the Table. Vnto every prick draw straight lines from the center C, so shal you have all the houre lines proper to this plane. Lastly, from E to F set

of the heighth of the stile 30 d. 59′, and draw the line C F, representing the Axis, which being erected at right angles, over the Substile C E, must point upwards to the North pole, so is the Diall fit for use, and must be placed according to the declination and reclination of the plane.

Chap. XX.

To draw the houre lines upon a North reclining plane, declining East or West, which cutteth the Meridian betwixt the Æquator and Horizon.

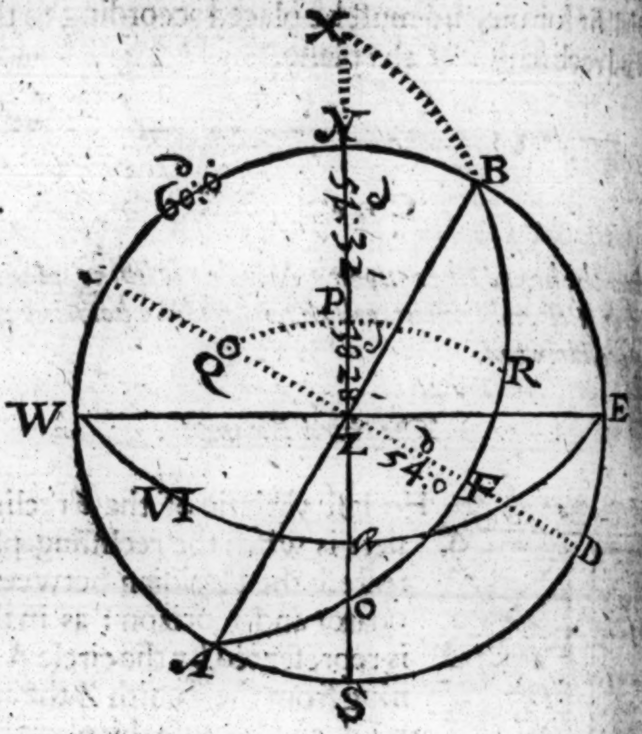
The third Example.

THe last varietie of the 6 reclining decliners is when the reclining plane intersecteth the Meridian betweene the Æquator and Horizon: as in the Scheme is represented by the circle A F B, reclining from the Zenith Z the angle Z A F 54 d. and because this plane declineth so farre Westerly, and cutteth the Meridian above the Tropique of ♑, the Sunne shall shine, both upon the inclining and reclining part thereof, according to the declination of the Sun, as by the seventh proposition of the 34 Chapter more at large doth appeare.

The *Demonstration.*

Now as you have done before, so must you in this Diall also (the making whereof differeth little from the former) seeke the foure things before mentioned, ere you can calculate the houre distances; *viz.* First, the distance of the Meridian and Horizon. Secondly, the heighth of the pole or stile above the plane. Thirdly, the distance of the Substile from the Meridian; and lastly,

ly, the angle betweene the two Meridians, all which [illegible] drawne out of the Scheme adjoyning.



Data	Elevation of the pole N P		51 d. 32'.
	North: Declining West N C		60 d. 0.
	North: Reclining Z F		54 0'.
Quæsita	1 distance of Meridian and Horizon A O		35 d. 37'
	2 the heighth of the Stile P R		54 43
	3 distance of substile and Meridian	O R	123.19
		X R	56.41
	4 angle between the two Meridians	OPR	118.13
		XPR	61.47

Wherein A O is the distance upon the plane of the Meridian

N

from the Horizon at A. Secondly, R O is the distance of the plane of the Substile Q P R from the Meridian N Z S. Thirdly, P R is the heighth of the pole or stile above the reclining plane A O R B: and lastly, O P R the angle betweene the two Meridians, Q P R of the plane, and N P S of the place.

The Arithmeticall calculation.

First therefore (as afore) in the triangle D Z S, having the side Z F, the reclination 54 d. and the quadrantall side Z D 90 d. and the side D S the declination, (which is the measure of the angle D Z S 60 d, you may *by the second of the fift Case* find out the side O F by the triangles S Z D, or O Z F, the complement thereof is A O the thing desired. For

			Logar.
As the whole sine Z D	90 d.	0′	10000.00
Is to the sine of the side Z F	54	0	9907.95
So is the tangent of D S	60	0	10238.56
To the tangent of F O	54	29	10146.51

Therefore A O the complement thereof 35 d. 31′, is the distance of the Meridian and Horizon.

Secondly, In the same triangle you may find Z O *by the second of the eighth Case.* For

			Logar.
As the sine of the declination D S	60 d.	0	9937.53
Is to the whole sine S Z	90	0	10000.00
So is the sine of F O	54	29	9910.59
To the sine of Z O	70.	2	9973,06

Adde Z O 70 d. 2′ unto P Z 38 d. 28′. so you compose the whole line P O 108 d. 30′, whose complement to 180 d. is P X 71 d. 30′.

Thirdly, In the same triangle O P R you may find P R *by the fifteenth*

fifteenth of 4 Regiomontanus, *or second of* 14 *Finkius*, be[...] the Hypotenusas and perpendiculars are proportionall [...] other. For

			Loga.
As the sine of the Hypotenusa O Z	70 d.	2'.	00[...]
Is to the sine of the perpendicular Z F	54	0	990[...]
So is the sine of the hypote: P X the cōple: of P O	71	30	997[...]
To the sine of the perpendicular P R	54	43.	19911[...]

Which 54 d. 43'. is the heighth of the stile or pole above th[e] plane.

Fourthly, In the same triangle you may find R O *by the fif*[-]*teenth of* 14 Finkius, *or second of* 4 Pitiscus: but because R O and P O be both of them more then quadrants, continue the sides R B and P N unto X, and find the Complement of R O in the triangle P R X. For

			Loga.
As the tangent of the perpendicular Z F	54 d.	0'.	9861.[...]
Is to the sine of the base F O	54	29.	9910,[...]
So is the tang. of the perpēdicular P R	54	43	10150.[...]
To the sine of the base R X	56	42	9922,0[...]

Which 56 d. 42'. or rather 123 d. 19'. the Complement thereof is the distance of the Substile and Meridian, reckoning from the South, R O being more than a quadrant, and R X the side found, which is the distance from the North.

Fifthly and lastly, in the triangle O P R you may find the angle at P, or rather in the triangle R P X, which is the Complement thereof, *by the second of the* 15 *or* 16 *Cases*. For

			Logar.
As the sine of R P	54 d.	43'	9911.84
Is to the tangent of R X	56.	42	10182,51
So is the sine of P R X	90	0	10000.00
To the tangent of R P X	61	48	10270.67

R P X being 61 d. 48'. is the angle counting from the North, therefore O P R the complement thereof to 180 d. which is

78 d. 12′. the angle betweene the two Meridians reckoned from the South.

Houres and parts from the substile.		Equinoctiall distances.	Logarithmes of tangents.	Houre arches on the plane.	Differ.
		d ′		d ′	d ′
4	8	1.48	8405.09	1.27	6. 9
.	½	9.18	9125.24	7.36	6.14
3	9	16,48	9391.27	13.50	6.23
.	½	24.18	9566.18	20.13	6.37
2	10	31.48	9703.95	26.50	6.54
.	½	39.18	9824.59	33.44	7.15
1	11	46.47	9938.89	40.59	7.39
.	½	54.17	10055.10	48.38	8. 3
12	12	61.47	10182.21	56.41	8.27
.	½	69.17	10334.12	65. 8	8.49
11	1	76.47	10541.04	73.57	9. 3
.	½	84.17	10911.37	83. 0	

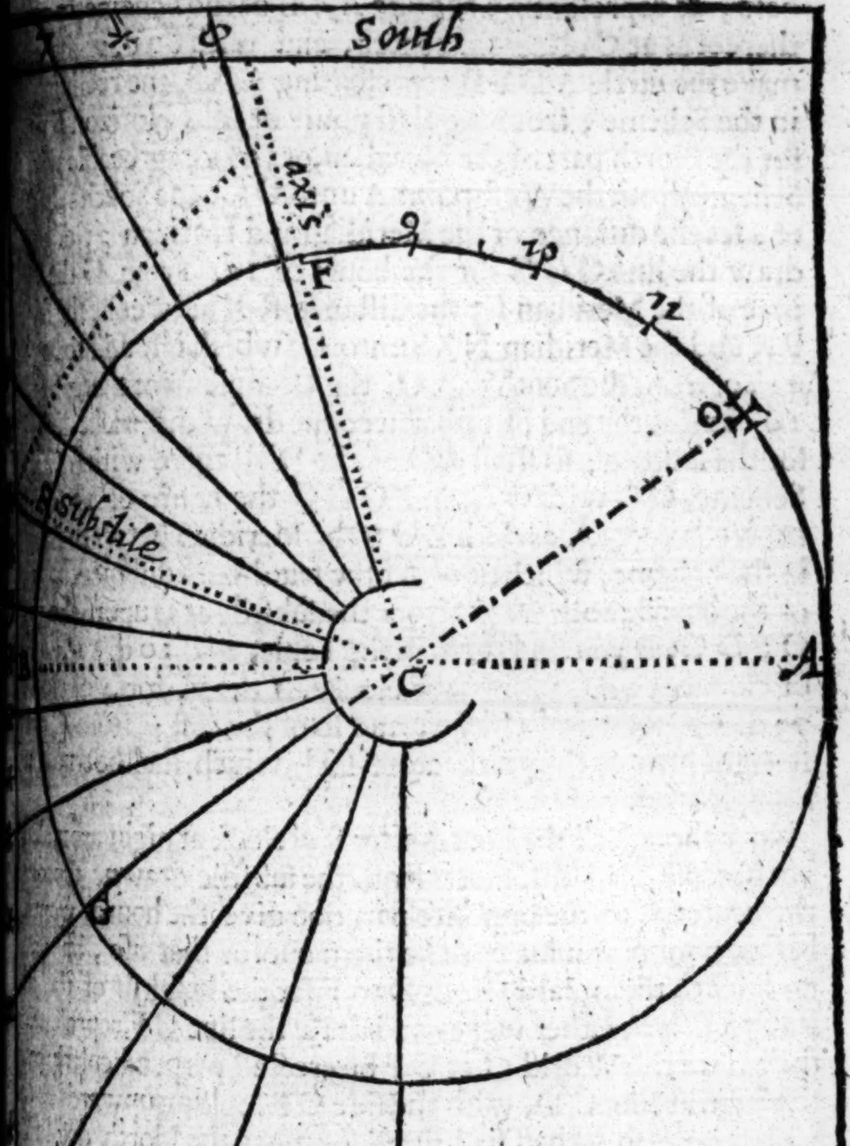
Houres and parts from the substile.		Equinoctiall distances.	Logarithmes of tangents.	Houre arches on the plane.	Differ.
		d ′		d ′	d ′
.	½	5.43	8912.30	4.40	6.11
5	7	13.13	9282.63	10.51	6.18
.	½	20.43	9489.56	17. 9	6.30
6	6	28.13	9641.46	23.39	6.46
.	½	35.43	9768.58	30.25	7. 4
7	5	43.13	9884.79	37.29	7.27
.	½	50.43	9999.08	44.56	7.52
8	4	58.13	10119.71	52.48	8.16
.	½	65.43	10257.50	61. 4	8.39
9	3	73.13	10432.40	69.43	8.58
.	½	80.43	10698.43	78.41	9. 8
10	2	88.13	11418.58	87.49	

These

These things prepared, I proceed to make the Ta-
the houre distances from the substile., wherein confi-
that the angle P betweene the two Meridians conta
118 degrees. 13'. reckoned from the South, whereof
degrees is answerable to seven houres from the M
dian, you may conclude, that the substile of this Diall
clining so farre West, must be placed betweene the seve
and eighth houres, reckoning from the South part of the Me
dian, or betweene the fourth and fifth houres from the Nor
part thereof, wherefore begin the Table either with 5 and
or with 4 and 8, as in this example is done. Vnto these hou
and parts first set their Equinoctiall distances from the substile
which are thus found. Take *60* d. the æquinoctiall distance
foure of clocke from the Meridian, out of *61* d. 47'. the distance
of the substile from the Meridian, and reserve 1 degree 47'.
for the distance of 4 and 8 from the substile, unto which con-
tinually adde 7 degrees 30'. for the halfe houres, and 15 de-
grees for the whole houres under *90* degrees. The other side
the Table may be made up by the Complements to these, be-
cause the arches of every six houres *90* d. distant in the Æquin.
are Complements each to other: this being done, take the Lo-
garithme of 54 d. 43'. *99*11.85, the heighth of the stile, into
piece of paper, and adde it continually unto the Logarithme-
call tangents of *16* d. 47'. *9479*.43. for 3. and *9*. of one side
the substile, and of 73 d. 13'. 10520.57. for *9*. and 3. on the o-
ther side of the substile, *6* ho. distant from the former: so have you
new Logarithmeticall tangents, *viz.* *9391*.28: and 10432.4
which set downe in the Table. Lastly, seeke these new Loga-
rithmeticall tangents in the Canon, so shall you find 13 d. 50'.
and *69* d. 43'. the true houre arches upon the plane, which by
helpe of the chorde are to be set both wayes from the substile, as
hath beene often directed heretofore.

The Geometricall projection.

Now then to make this Diall upon the plane, draw the Hori-
zontall line A C B about the middle of the plane, parallell to the
[illegible]



North declining West 60. d. 0'.
Reclining 54. 0'.

base, & representing the line A Z B of the Scheme. In any
thereof as at C place the center, and with 60 d. of the c
make the circle A D F B, representing A F B the reclining
in the Scheme, from the East point of the Horizon B
for the North part of the Meridian, or (more agreeable with
Scheme) from the West point A unto O for the South part
of; set the distance of the Meridian and Horizon 35 d. 31,
draw the line O C G for the houre of 12. From G the N
part of the Meridian set the distance R X betweene the subst
P R and the Meridian N Z S unto D, which is found to be 56
41′, or from the South part O, the Complement thereof 123
19′. and at the end of either account draw the prickt line C D
for the substile; so shall A O of the Diall agree with A O of the
Scheme, O D with O R, and O C G the houre of 12 shall
between A & D, as doth Z O S the Meridian between
in the Scheme; which done, set the true houre distances by
of the chorde both wayes from the substile at D upon the
O F D G, as you find them in the Table, *viz.* 10 d. 51′. for
of clocke, 52 d. 48′. for 8 of clocke, 1 d. 27′. for 4 of c
73 d. 57′, for 11 of clocke, and so of the rest; from C dr
streight lines to the pricks afore-said, which shall be true hou
lines desired.

Now though all the houres after 8 of clock at night are uselesse
yet because their distances from the substile drawne thorough
the center C to the opposite part doe give the houres wanting
before noone, you may pricke them out for that use, but draw
no lines to them; lastly from D to F set the heighth of the
P R 54 d. 43′. either wayes, and draw the line C F, representing
the axis of the World: Let C F be erected perpendicularly on
the Substile line C D, with the side C F looking upwards to the
North pole, so is the Diall fitted for use to the North declining
plane 60 d. Westerly, reclining 54 d.

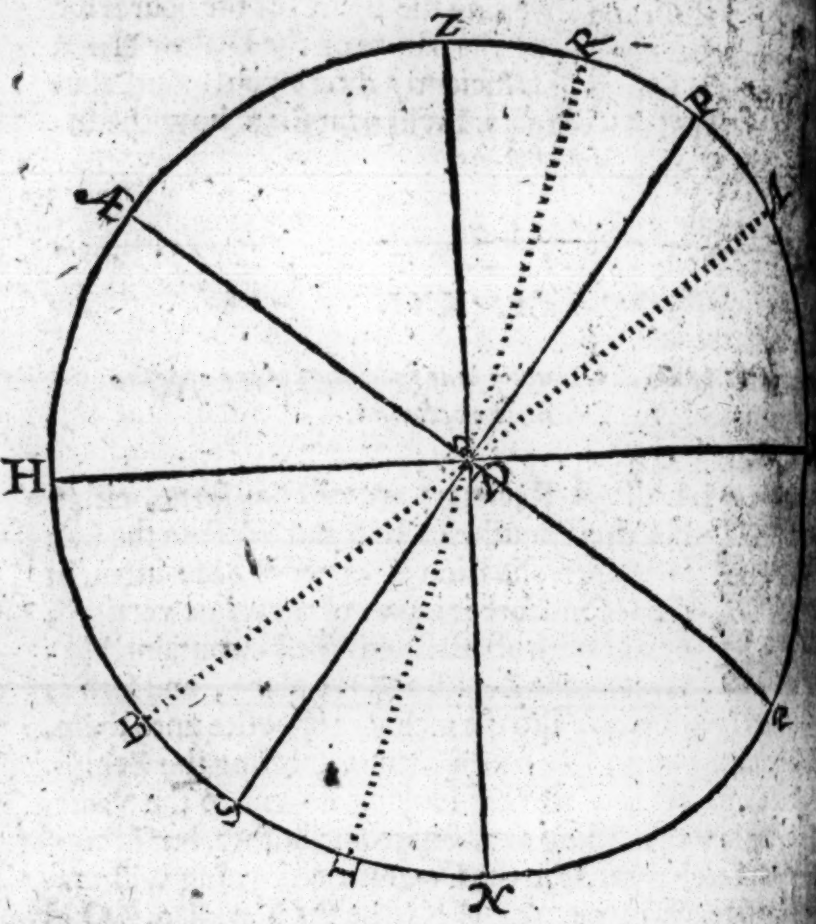
And thus have you againe at one worke (as hath beene often
said heretofore) made foure severall Dials, *viz.* this for one, and
his opposite South declining Easterly 60 d. inclining to the Ho-
rizon 36 d.: as also the North declining Easterly 60 d. recli-
ning 54 d. and his opposite South declining Westerly as much
incli-

to the Horizon 36 d. onely turning the Dials up and [...]les and all, and changing the figures of the houres for [...] and afternoone, as the nature of the Diall or Plane, [...] reason it selfe will sufficiently direct you. And thus [...] all kind of Recliners, I will next shew how the In-[...] be drawne out of them.

CHAP. XXI.

[To dr]aw the houre lines upon any inclining plane opposite to the direct reclining.

ALL direct Recliners are of two sorts, either North or South, or East and West; in the first sort, the reclination is part of the Meridian, in the second sort it is part of the prime verticall, or Azimuth of East and West, contained betweene the Zenith and the plane, and such as [...] Recliners are, such are also the incliners opposite unto them, [...]ne being the upper face of the plane respecting the Zenith, [...] other the nether face thereof looking downe to the Nadir, [...] varying indeed nothing at all one from another, but in con[...]sition of each part, as in the Diagram adjoyning will ma-[...]y appeare. Wherein let Z H N M be the Meridian, Z O N [...] prime verticall, H D M the Horizon, Æ O D æ the Equi-[...], P O S the axis of the World, P the North pole, S the [...] pole, Z the Zenith, and N the Nadir, R O I and A O B [...] reclining planes, the one reclining lesse then the North [...], the other more; R D I, A D B two inclining planes, the [...] inclining lesse then the South pole, the other more, the up-[...]perface in the recliners respecting the Zenith Z, as the nether [...] in the incliners doe the Nadir N as aforesaid. Now as the North pole P, or rather the semiaxis O P is elevated above the [...]clining plane A O the angle P O A, so is the South pole S, or rather the semiaxis D S, depressed under the inclining part of that plane B D the angle S D B, equall to the former; but in the other



other example as R D the inclining face of the plane R D I is elevated above the North pole P, so is O I, the reclining face of R O I, depressed under the South pole S, with like and equall angles at the center; from which analogie you may conclude, the Diall made to the one face of the plane will serve for the other, and the heighth of the stile to the one, is the same to the other, seeing both faces of the planes have like respect to each pole, only turning them up and downe respectively to their poles, viz. where the stile of the reclining plane respecteth the North pole, the stile of the opposite the inclining plane must respect the South pole; as in the first example, which is contrary in the second.

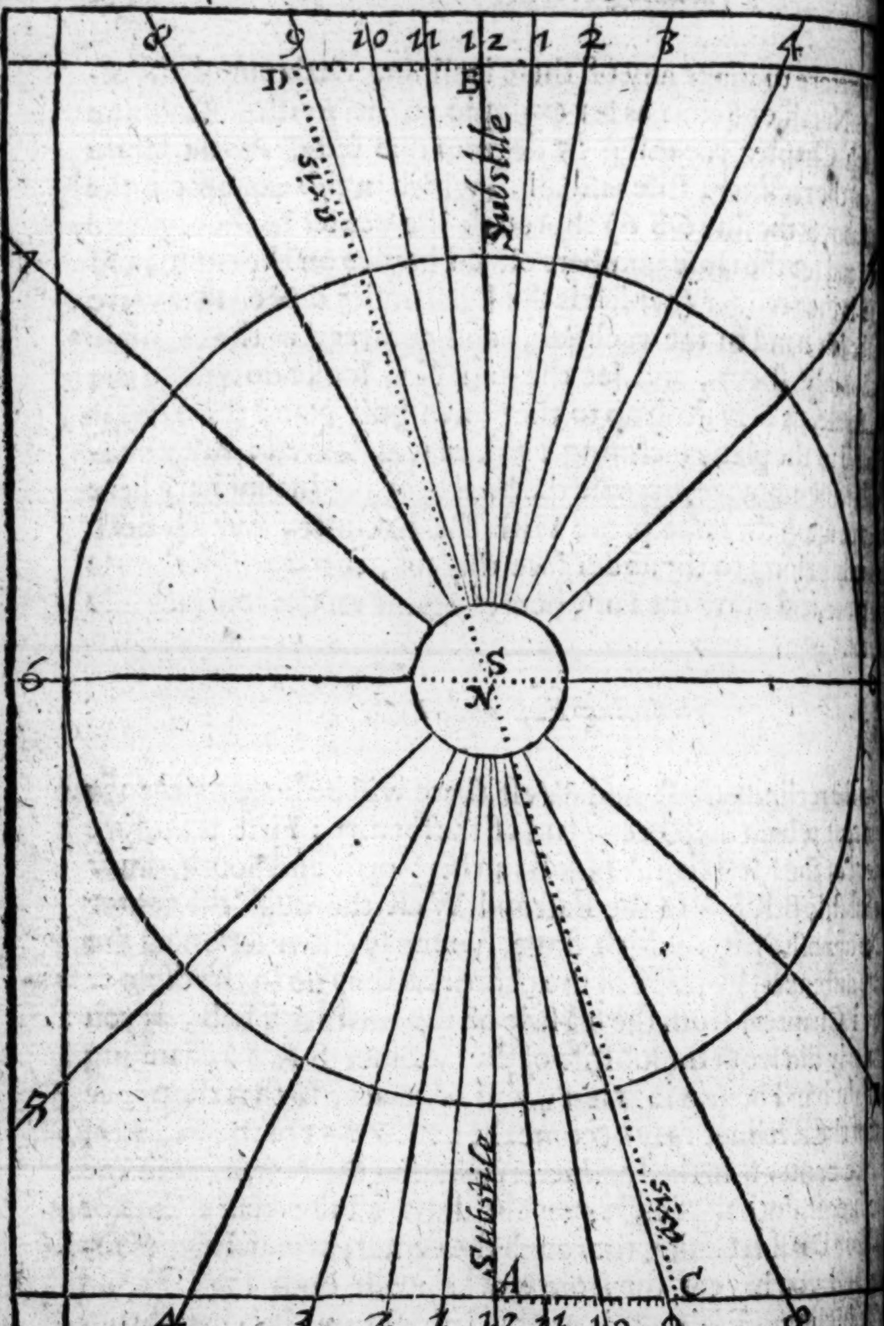
Inclining North and South.

Therefore to make any of these inclining Dials out of the re- ... North or South as for example to the South plane of the ... Chapter reclining 55 degrees doe but draw the houre ... of the recliner, stile and all, (which in this example is the ... above the line 6 S 6) thorough the center to the opposite ... and set the same numbers of the houres on the right hand ... in the recliner (which is the Diall under 6 N 6) that were ... the left hand in the recliner, and contrary as the example ... plainly shew, and let the axis N C looke downe to the ... pole, as S D doth up to the North pole, and the Diall is ... ished to the plane inclining 55 d. as was desired: Adde one- ... this remembrance, because the houres of the Incliner are here ... drawne upon the same plane with the Recliner, which doth ... properly belong to the under face thereof, therefore perforate the paper, and draw the same houres againe on the contrary side thereof.

Inclining East and West.

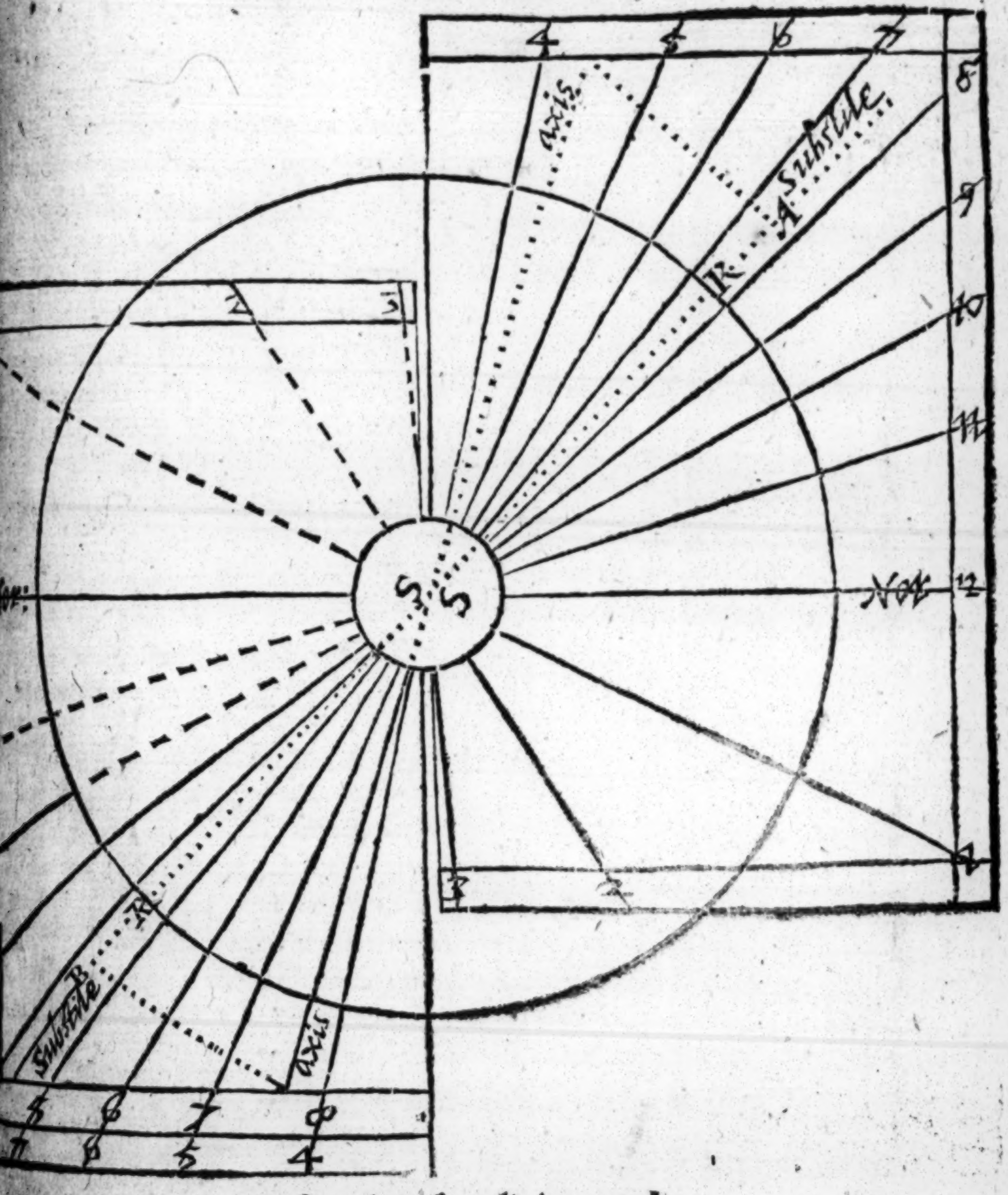
In the reclining East and West, there will be little difference from that which hath beene said of the former: First therefore instead of the Meridian A N S B in the North and South, draw the Substile B R S A in the East and West thorough the center to the opposite part, which done, you may either set on all the houre distances, by helpe of the chorde, as they lie in the table of the 11 Chapter) from the substile of the Incliner S R B, as you formerly did from the substile of the Recliner S R A, changing the right hand houres into left, and contrary, so that the upper part of the Recliner may become the nether part of the Incliner, and the center S in the Incliner, respecting the North, as in the Recliner it doth the South; or else draw all the houre lines of the East Diall reclining thorough the center, as you did the substile, and you have at the same worke made both the East and West inclining Dials 35 d. as you desired; onely remembring

South reclining 55 d



North inclining 55 d.

East and West inclining. 35 d.



East and West reclining 35 d.

Place this Folio 221.


7
6
5
4

the West inclining to take the complements of the recli- ning houres to 12, and that but from three of clock afternoone, till eight at night, because the Sunne forsakes the reclining part of that plane 33′ after two, and then shines upon the op- posite. Likewise for the East inclining both the houre lines and numbers serve as they stand, but must be taken (by perforation) on the other side of the paper. From hence you may collect that the reclining East and inclining doe both receive the Sunne together at his rising, and the reclining West, and inclining con- tinue to shew the houres till Sunne setting: with this mutuall supply, that as the Sunne in ♋ forsakes the East reclining plane at halfe an houre past two afternoone, so doth it enlighten the West inclining plane at the same time, and as it forsaketh the East inclining plane at halfe houre after nine in the Mor- ning, so doth it shine upon the West reclining plane at the same time, and each paire of them together make up the whole diurnall arch of the Sunne considered respectively.

CHAP. XXII.

To draw the houre lines upon any inclining declining plane opposite to the reclining declining.

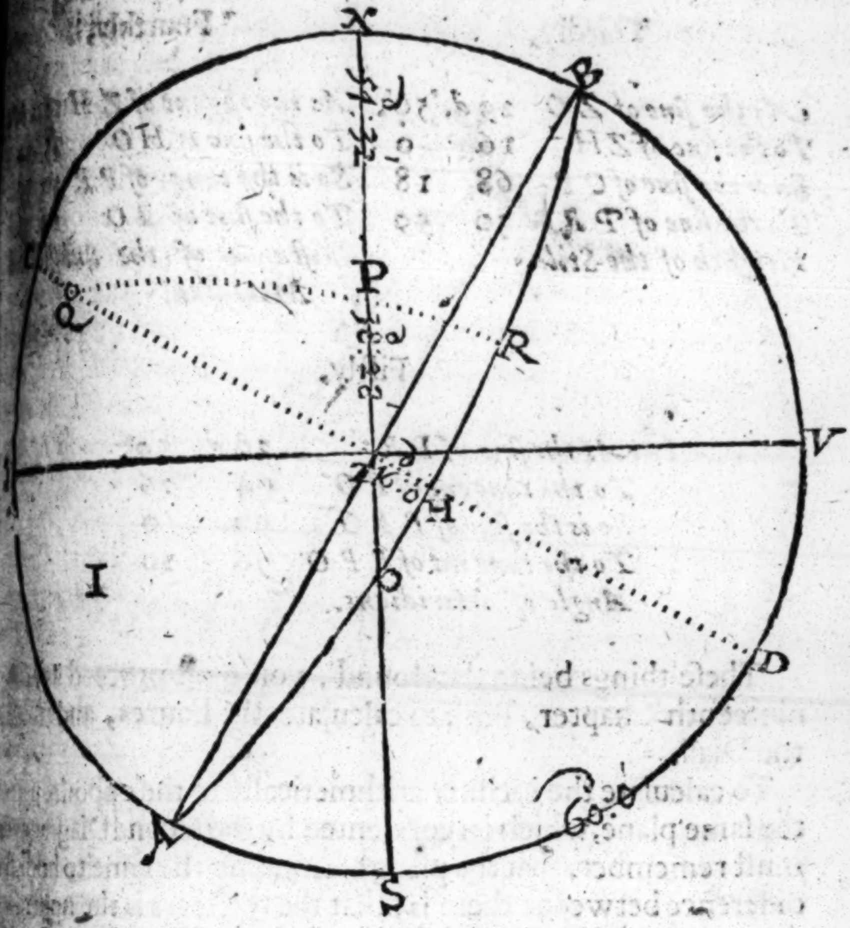
I Have formerly shewed the six varieties, inci- dent to the reclining declining planes, and thinke it needlesse to instance in them all, how the incliners may bee deduced out of them, considering that one rule may be given for all, which will not much differ from the latter sort of the simple recliners, seeing the reclination is alike proper to each, and the deviation of the Substile from the Meridian, so directly agreeing in nature with the Decliners, that by the last precept of the seventeenth Chapter, they may be both redu- ced to one and the same.

If therefore any reclining Diall be so inverted, that the upper part thereof may become the nether, and after this inversion

the right side of the recliner become the left side of the incliner, and contrary, the inclining Diall of the same declination shall be framed out of the reclining, or contrary; only the forenoone houres in the recliner will become the afternoone houres in the incliner; and againe, the afternoone houres of the upper Diall the forenoone houres of the nether. To proove this rule to be agreeable both to reason and art (which may be also extended to all sorts of Dials whose houre lines are not paralels) I will describe two severall Schemes, the first proper to the reclining decliner, the second to the inclining Incliner, and set downe the parts of each, deducted out of its particular Scheme, that if you will be so curious, you may by this example calculate any declining inclining Diall, though for conclusion I will instance in drawing the one out of the other, as I have done in the former.

Let the example therefore be to make an inclining Diall to the nether face of the reclining plane of the nineteenth Chapter, which is a North declining West *60* d. reclining 1*6*.d. The first Diagram proper to this example is taken out of the nineteenth Chapter aforesaid, wherein (as there is mentioned) N F S V is the Horizon, N P Z S the Meridian, F Z V the prime verticall, P the North pole elevated 51 d. 32′ Z the Zenith distant from the pole 38 degrees 28′, A O R B the reclining plane, declining from the North part of the Meridian the arch N C *60* degrees and reclining upon the azimuth, crossing the base at right angles, the quantity of Z H 1*6* d.9′. the pole of the reclining plane so much elevated above the Horizon at C, as the plane it selfe reclineth from Z. Now there are foure things to be found out, (as in the nineteenth Chapter more at large doth appeare) before you can make the Diall *viz.* *A O* the distance of the Meridian and Horizon, P R the heighth of the Pole or Stile above the plane, R O the distance of the Substile and Meridian, and the angle O P R betweene the two Meridians. Wherefore,

First,



First,

As the sine of ZD	90 *d.*	0′.
To the tangent of D S	60	0
So is the sine of Z H	16	0
To the tangent of HO	25	31
Complement AO	64	29
Meridian and Horizon.		

Secondly,

As the sine of SD	60 *d.*	0′.
To the sine of S Z	90 *d.*	0
So is the sine of H O	25	31
To the sine of Z O	29	50
Adde Z P	38	28
Fit O P	68	18

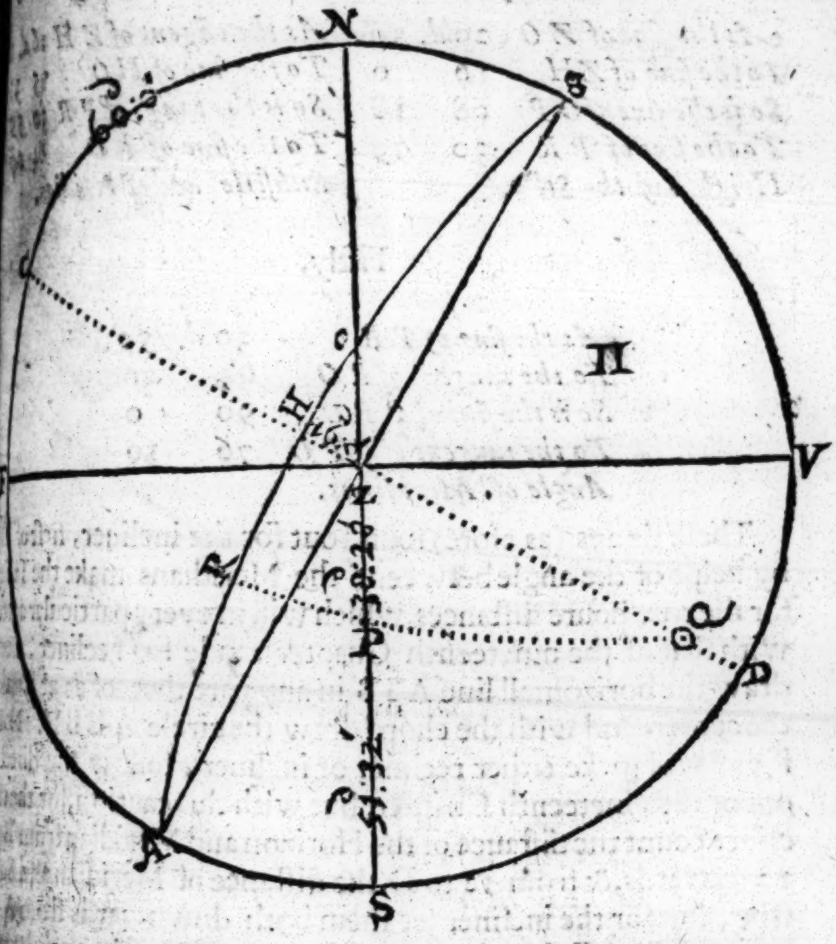
Thirdly,			Fourthly,		
As the sine of Z O	29 d.	50'.	*As the tāgent of Z H*	16 d.	0'.
To the sine of Z H	16	0	*To the sine of H O*	25	31
So is the sine of O P	68	18	*So is the tang. of P R*	30	59
To the sine of P R	30	59	*To the sine of R O*	64	26
Heighth of the Stile.			*Distance of the Substile and Meridian.*		

Fiftly,

As the sine of P R	30 d.	59'.
To the tangent of R O	64	26
So is the sine of P R O	90	0
To the tangent of R P O	76	10
Angle of Meridians.		

These things being thus found, you must proceed as in the ninteenth Chapter, both to calculate the houres, and to make the Diall.

To calculate the incliner arithmetically to the opposite part of the same plane, which is represented by the second Diagram, you must remember, that the plane continuing the same to both, the difference betweene them is, that the recliners is the upper face thereof, respecting the Zenith, and the incliner the nether face looking downe to the Nadir; wherefore againe make the like Scheme to the former, but turned the contrary way, and in all things respecting the contrary part of Heaven, there in A R O B shall represent the inclining plane, Z the Nadir, P the South pole, S D the arch of declination 60 degrees from the South part of the Meridian at S, & inclining upon the Azimuth D Z C the quantity of Z H 16 degrees O P part of the Meridian under the earth between the plane and the South pole, and Q the pole of the inclining plane, so much under the Horizon at D, as in the recliner it was above it at C: and generally in all things like to the former, but in contraposition, therefore the *Quæsita* of the second Scheme can differ nothing from the first, when as all the



Data thereof doe agree, yet to avoid all scruple, you shall see the operations deduced out of the second Diagram proper to the incliner, in every particular agreing with the first, which must needs conclude the truth of the former Rule as was proposed.

First,

As the sine of Z C	90 d.	0'.
Is to the tãgent C N	60	0
So is the sine of Z H	16	0
To the tangent H O	25	31
Complement of O B	64	29
Meridian and Horizon.		

Secondly,

As the sine of C N	60 d.	0'.
Is to the sine of N Z	90	0
So is the sine of H O	25	31
To the sine of O Z	29	50
Adde to Z P	28	38
Fit O P	68	18

Thirdly,

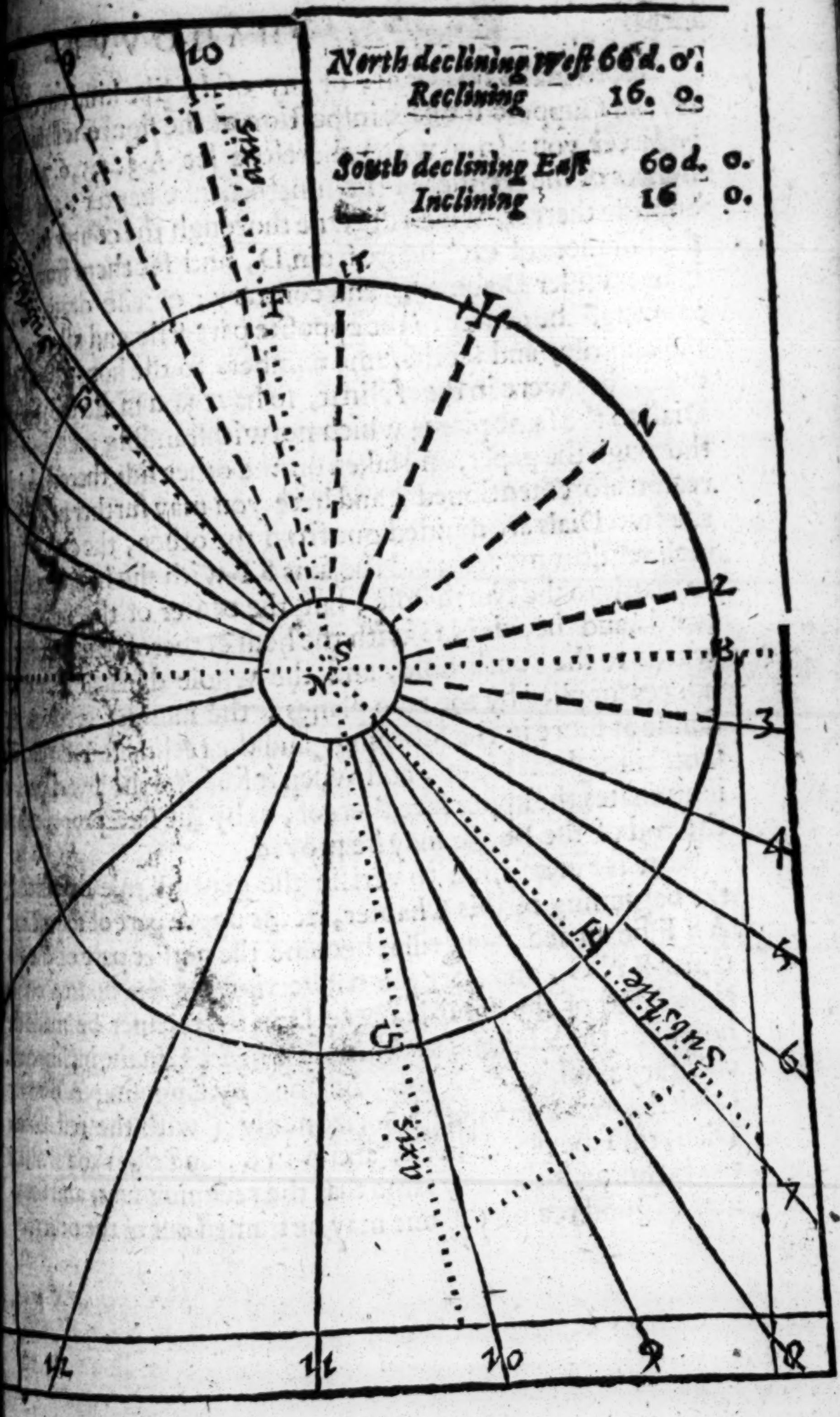
Thirdly,			Fourthly,		
As the sine of Z O	29 d.	50'.	*As the tãgent of Z H*	16	
To the sine of Z H	16	0	*To the sine of H O*	25	
So is the sine of O P	68	18	*So is the tang. of P R*	30	
To the sine of P R	30	59	*To the sine of R O*	64	
Heighth of the Stile.			*Substile and Meridian.*		

Fiftly,

As the sine of P R	30 d.	59'.
To the tangent of R O	64	26
So is the sine of P R O	90	0
To the tangent of R P O	76	10
Angle of Meridians.		

These things (as afore) found out for the incliner, first of all by helpe of the angle betweene the Meridians make the Table for the true houre distances, which will in every particular agree with that of the nineteenth Chapter made for recliner, next draw the horizontall line A S B, in any part thereof as at S make the center, and with the chord draw the circle A E B D. Now if you will make either recliner or incliner, follow the directions of the nineteenth Chapter, but with this caution, for the recliner count the distance of the Horizon and Meridian from B to 12 upwards, & from 12 to D the distance of Meridian and Substile, but for the incliner set them both downwards from A to 12, and so to E (as the very Diagrams themselves with reference to the North and South parts of the Meridian will sufficiently instruct the ingenious practitioner.) The place of the Substile being thus found, take out of the nineteenth Chapter the true houre distances, set them from E both wayes for the incliner, as there you did from D for the recliner, stile and all, so have you done; adde onely the remembrance of the former Chapter (because I will make one Scheme serve two turnes) that since in this instance the inclining Diall is drawne on the same side of the plane with the recliner, which in the naturall position is opposite thereunto; therefore pricke the houre lines thorough the paper, and draw them againe on the other side, so shall they serve the turne, numbers, stile and all, without further alteration.

North


North declining West 66d. 0'.
Reclining 16. 0.
South declining East 60d. 0.
Inclining 16 0.
9
10
axis
F
H
1
2
B
3
4
5
6
7
S
N
D
E
Substile
G
axis
12
11
10
9
8

But to make this Diall, or any of the like kind out of the recliner, I suppose the bare inspection of the figure will sufficiently direct you: In a word therefore let A 3.4.5.6.7.8. be the houres of the recliner in the nineteenth Chapter, and D the Substile thereof, which drawne thorough the center to E, take the distances of each houre from D, and set them from E, the houres under D above E, and contrary; or else draw them thorough the center to the opposite part, stile and all, as you did the Substile, and set the same numbers to the houre lines continued, that were in the recliner, so have you made the inclining Diall to the same plane; which notwithstanding must be pricked thorough the paper, and taken on the other side thereof, for the reason aforementioned; and here you may further note, how the two Dials are diuided one from the other, the center of the recliner downwards, and the axis S F with the houres pointing upwards to the North Pole, but the center of the incliner upwards, and the axis N G with the houres therof pointing downwards to the South pole, and the whole diurnall arch of the houres supplied by the two planes, the incliner receiving the Sunne at foure in the Morning, and the recliner continuing the same till eight at night, and when it forsakes the lower face, it illuminates the upper face thereof, as by the sixt proposition at the end of the Booke may be proved.

Now for conclusion to verifie the generall rule delivered in the beginning of this Chapter, let the upper part of the recliner A S F be turned about till it become the nether part of the Incliner B N G, and after this convertion let the houres on the right hand of the Substile neere D in the recliner be made the houres on the left hand of the substile neere E in the incliner, and contrary; which may easily be done by supposing A F S to be carried about the center S horizontally (with the rest of the Diall) till F be placed in G, and A in B, and then you shall see the inclining is the very same that the reclining was, and therefore by good reason the one may be framed out of the other.

CHAP.

CHAP. XXIII.

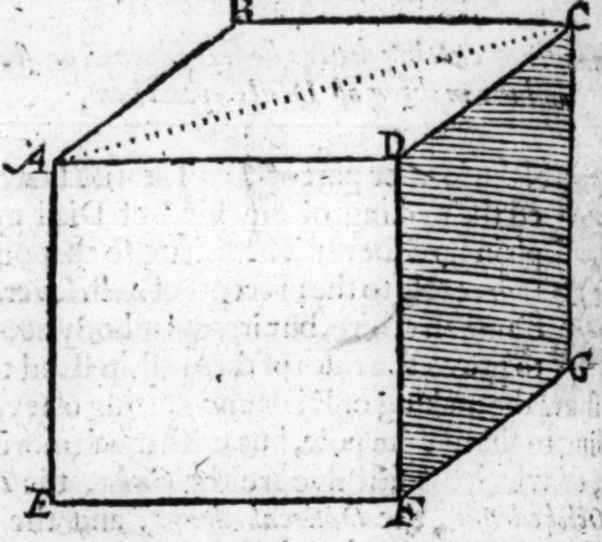
Of the manner of cutting divers bodies in wood or stone, and the making of Dials upon them.

IN the former part of this Treatise I have shewed the making of any kind of Diall upon any plain howsoever it be situate, so that one might (agreeable to the precepts of each severall plane) frame an entire, but irregular body at one view to prove the rules of them all, in stead thereof I rather shew the making of Dials and cutting of seven other bodies tending to the like purpose, but with much more delight and variety, of which the first five are the *Cube*, the *Tetrahedrum*, the *Octohedrum*, the *Dodecahedrum*, and the *Icosahedrum*, the five regular bodies inscriptible in a Sphere, the other two, the one of 12, the other of 30 *Rhombes*, devised by my worthy friend Master *Henry Briggs* our English *Archimedes*, from whom I received directions for the cutting of these two bodies, and some of the rest also, and doe in memory of him commend it to posterity.

Now because the Cube is as it were the moles, or lumpe, out of which the rest are contriued, I will first speake thereof, though there be little curiosity belonging to it.

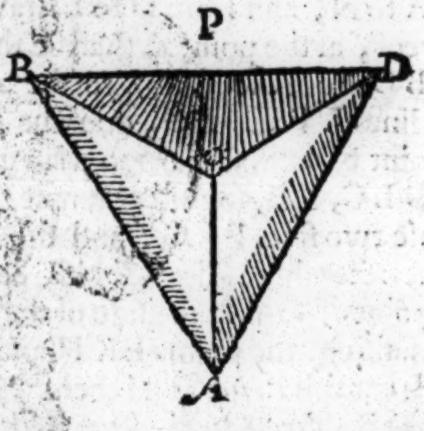
How to cut the Cube.

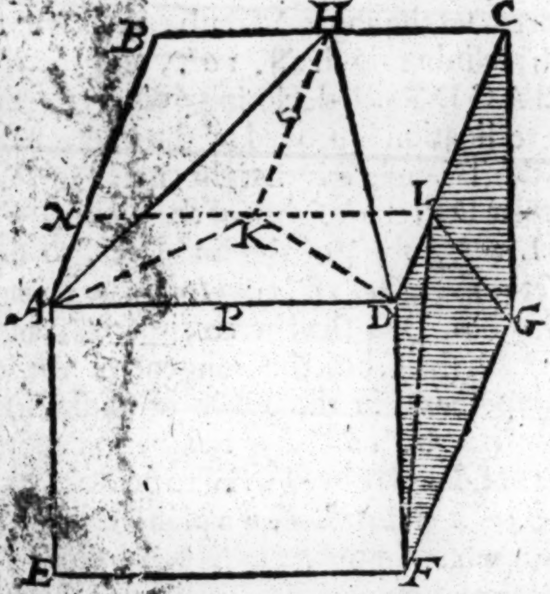
A Cube is a solide bodie comprehended of six equall squares, as are A B C D, A D E F, and D C F G, &c. the cutting of this body is plaine, by the definition: for let every side of every square be equall, as A B to D F, A E to C G, &c. and you make a Cube of what greatnes you will. This body is capable of five ordinary Dials, the sixt square being the base to stand upon, wherfore if you set the side A D E F South, then will the side opposite thereto be North, D C F G East, and the side opposite thereto West, and A B D C horizontall, all which Dials are ready made in



in the *6.7.8.* and *9.* Chapters; but if you place any angle of the horizontall, as A D C South, then will every ſide decline 45 d. for if you draw the Diagonall A C repreſenting the line of Eaſt and Weſt, and ſuppoſe the two ſides of the Cube C D and A D to move upon the centers A and C from the Diagonall A C, where they have no declination at all, till they croſſe each other at right angles in D, there ſhall be made a right lined right angled Triangle, whoſe three angles are equall to two right angles by *the* 32 *of the* 1 *Euclid. and* 49 *of the* 1 *Pitiſcus*: but the angle D is a right angle by the worke, therefore the angles at A and C ſubtended by equall ſides are 45 d. a piece, and conſequently each ſide declineth from the line A C 45 d. wherefore D C F G is a South declining Eaſt 45 d., and A D F E, a South declining Weſt as much, and their oppoſites North declining Eaſt and Weſt 45 degrees, all which foure Dials are in effect but one, ready made in the tenth Chapter, obſerving the cautions therein mentioned.

How to cut the Tetrahedrum.





The *Tetrahedrum* is a solid body comprehended of foure equall equilaterall Triangles, as are A C B, A C D, and D C B, to cut this body, you must first make a paralellepiped B E F C: let the breadth A D be 10000, and the heighth A E the root of $\frac{2}{3}$, 81649, and the length A B the root of $\frac{3}{4}$, 86602, upon the upper

per face and baſe thereof draw two oppoſite equaliter Triang
as is A D H, divide the perpendicular thereof P H equall to A
or D C, into three ſeverall parts, let the third part ther
28867 from A to N, and from D to L draw the line N L in
middle whereof, at the point K ſhall be the vertex C, or top
the ſolide A B D; from the point L to the angles F and G draw
two ſtraight lines L F and L G, doe the like on the oppoſite
ſide by the point N, cut off the two triangular portions L D F,
N A E, and G L C, N B, ſo will remayne the ſolide body called
Priſma, whoſe two ſides F L G, and the oppoſite, are equall
Triangles, the other three ſides L F N E, &c. are paralelograms;
Next by the points F K H & the ſide of the Triangle F H drawn
in the baſe, as alſo by the points E K H, and the other ſide of the
Triangle E H, cut this *Priſma*, and there will come forth the ſo-
lid body A C D B, the *Tetrahedrum* deſired. The body being
thus prepared, ſet the angle A South, then will the ſide B C D
be a North reclining 19 d. 28′. 16″., and the other two ſides
A C B and A C D South declining 60d. 0′., reclining as the for-
mer, the reclination is proved by the figure, whereon the body
is cut. In the Triangle F D L right angled at D, you have the
perpendicular D F, the heighth of the figure 81649, and the leſ-
ſer ſide D L 28867 the ⅓ of the line D C, to find the angle at
F, *by the ſeventh Caſe of right angled plane triangles*: or if you
make F D radius, D C ſhall be 10, 606596, and D L 35355,
the ⅓ of D C ſhall bee the tangent of the angle L F D,
which being found in the Table of naturall tangents, ſhall
give 19 degrees 28′. 16″: the reclination deſired. The decli-
nation of the ſides may be proved to be 60 d. by the angles, for
by the 53 *of the* 1 *of Pitiſcus*, if a plane Triangle be inſcribed in
a circle, the angles in the periphery oppoſite to the Circumfe-
rence, are ½ the Circumference oppoſite to the angles, but every
ſide of an Æquilater Triangle ſubtendeth 120 d. of the Circum-
ference, therefore every angle the ½ thereof 60 d. if therefore
you ſuppoſe B D of the ſolid to be paralell to the line of Eaſt and
Weſt, and that D A and B A move from that line upon the cen-
ters D and B, till they croſſe each other in A, making the ſides
equall,

the angle shall be also equall, *by the fift of the first of Pi-* each containing 60 d. as aforesaid. Having the reclinati- of the North plane, the Diall proper thereto is to be made the second kinde of the 14. Chapter, whose houre distances the Meridian are as followeth.

Houres and parts from the Merid.		Houre arches on the plane.		Houres and parts from the Merid.		Houre arches on the plane.	
		d	'			d	'
12	0			9	3	40	17
0	½	6	22	0	½	47	50
11	1	12	48	8	4	55	44
0	½	19	21	0	½	63	57
10	2	26	4	7	5	72	27
0	½	33	2	0	½	81	10

North reclining	19 d.	28'.	16".
Adde thereunto	38	28	0
The heighth of the stile	57	56	16
The Logar.	9928.	1254.	

The other two South declining reclining have the same Diall serving for both, changing but the position of substile and houres, as the cautions of the tenth Chapter will direct you, and is to be made by the rules of the 16 Chapter, the particulars whereof with the houre distances from the Substile are as followeth.

Houres from the Substile.			Houre arches on the plane.		Houres from the Substile.			Houre arches on the plane.	
Houres.			d	'	*Houres.*			d	'
0	½	0	0	4	8	.	4	0	10
9	.	3	0	19		½		0	25
	½		0	35	7	.	5	0	41
10	.	2	0	52		½		0	58
	½		1	10	6	.	6	1	18
11	.	1	1	32		½		1	42
	½		2	0	5	.	7	2	13
12	.	12	2	37		½		2	55
	½		3	31	4	.	8	4	0
1	.	11	5	0		½		5	56
	½		8	8	3	.	9	10	36
2	.	10	19	26		½		29	2

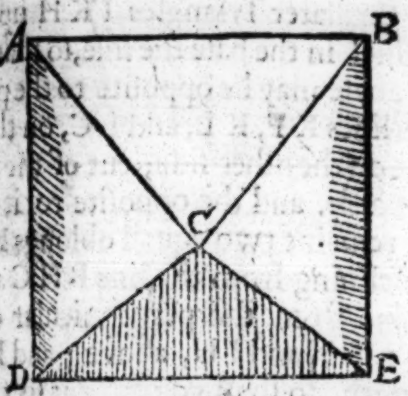
South reclining 19 *d.* 28'. 16''.
Declining East and West 60 0 0.

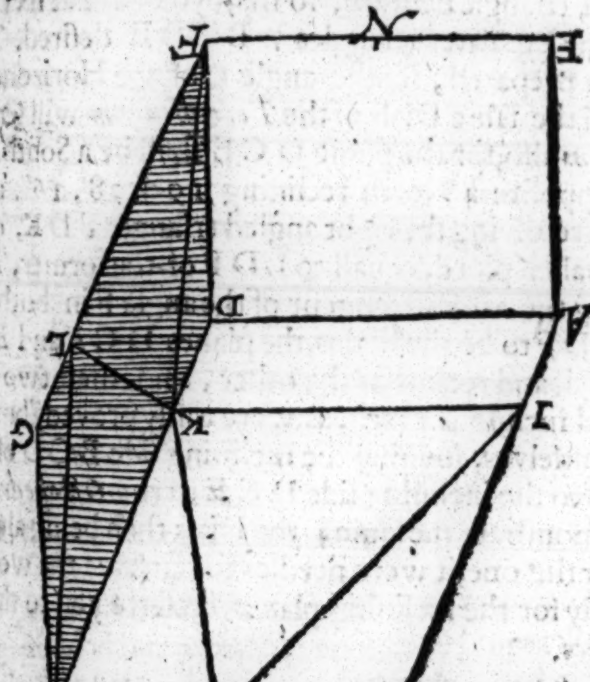
1 The arch of the plane betwixt the Meridian and Horizon. 60 d. 0'. 0''.
2 The arch of the Meridian betwixt the Plane and the Zenith. 35 15 52.
3 The heighth of the Stile or Pole aboue the plane. 1 50 53.
4 The distance of the Substile from the Meridian 2 36 56.
5 The angle betweene the two Meridians. 54 46 43.

Therefore the Substile falleth betweene 8 and 9 of the East Diall betweene 4 and 3 of the West 1 d. 50'. 53''. *Log.* 8508. 5170.

How to cut the Octohedrum.

The *Octohedrum* is a solid body comprehended of eight equall Equilater: Triangles, as are A C B, A G D, B C E, and E C D; To



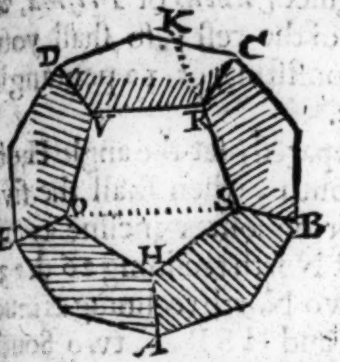


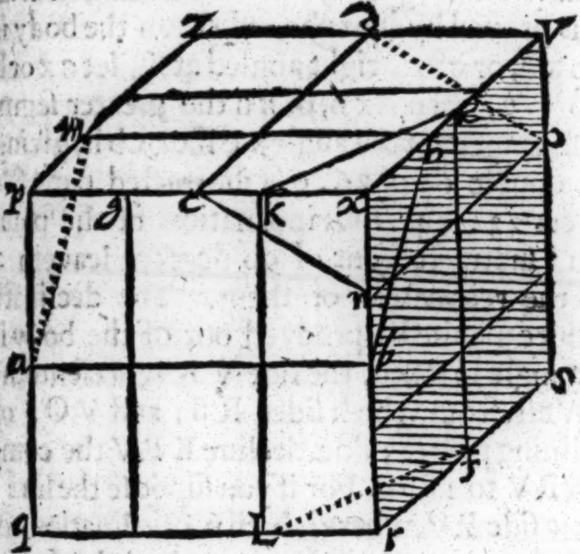
To cut this body, you may first make a Paralellepiped B E F C let the breadth thereof B C or A D be 100000 and the heighth thereof A E or C G the root of $\frac{2}{3}$ as afore 81649 and the length thereof B A or F G, the root of $\frac{3}{4}$ more by $\frac{1}{3}$ thereof 115470. Let A I and D K and L G be 28867 one fourth of A B or F G, by

by which draw the line I K upon the superficies, and the like by L in the base make two Equilater Triangles I K H upon the superficies,& from the point L in the base the like,so that the point N of the Triangle in the base may be opposite to the point H of the superficies, draw the lines K F, K L, and L C, on the one side of the figure,and the like on the other side; cut of the triangular portion I K F E downwards, and the opposite to it L G C I upwards,and there will remaine two equall oblongs K I B H C, and L F N E, the base inclining from the line B H C as much as the superficies doth recline from the perpendicular of E N F; next cut of the portions L K H and I H, above; and L K N and I N, by the triangle beneath, so shall you have at six cuts the solide of eight Equilater triangles A B C D E desired. The body being thus prepared, set the angle C of the Horizontall A C B South, and the same Dials of the *Tetrahedrum* will serve for the *Octohedrum* also,for the plane D C E shall be a South inclining, and his opposite a North reclining 19 d. 28′. 16″. as may be proved by resolving the right angled triangle F D K, or L G C. In this parallelepiped, equall to L D F of the former, D K, and D L, being the naturall tangent of the angle F in both of them, supposing D F to be the radius,the planes D C A and E C B shall decline 60 d. and recline as the other, and their two opposites decline and incline as much, as were easily proved, but that the bodies themselves, joyning the reclining side B C D of the *Tetrahedrum* to the inclining side D C E of the *Octohedrum*, will plainly demonstrate the same, the Dials then being already calculated for the one,it were needles to reiterate the work for the other, onely for the inclining planes, I referre you to the 21 and 22 Chapters.

How to cut the Dodecahedrum.

The *Dodecahedrum* is a solide body comprehended of 12 equall Equilater pentangles, as are H S R V O, H S B A, and H O E A &c. To cut this body, you must first make a Cube as is p q r s v, divide each side into halfes, as p q at a b : r s at f: and x p at c d. Let each halfe p a, x e, and r f be the radius





or 100000 divided by extreame and meane proportion p g, x h, and VO ſhall be 61803 the greater Segment, and g c, h e, and and n b 38196 the leſſer Segment, and ſo muſt the reſt of the ſides be alſo divided, but with this caution, that the middle lines and ſegments of every ſide conterminous be drawne croſſe to other, as thoſe of p q, r x, croſſe to thoſe of x r, S V, and they againe croſſe to them of p x, V Z. yet every oppoſite ſide paralell to o-ther; From the greater ſegment of the one ſide, to the middle line of the other, draw ſtreight lines croſſe the body, as are n c, k e,

and h b. Cut off each trianguler *Cuneus* or *Prisma, viz.* n o d e, L K f e, and m h b a, and so of the rest; so shall you at 12 cuts frame the *Dodecahedrum* consisting of 12 pentangles, as is represented by the first figure.

The body being thus prepared, set the angle H of the Horizontall plane H S R V O South, then shall the five superior planes recline, and their opposites incline as much: viz. R V D K C shall be a direct North reclining 26 d. 33′. 54″. and V O D E, and R S B C, two North reclining as much, and declining also 72 d. H O E A, and H S B A, two South reclining as much, and declining also 36 d. the reclination of all five being the same, is proved by the cube, whereon the body is cut: for in triangles b x h, or c x n, right angled at x, let c x or b x, be the radius, 10 0000, then is x n, or x h the greater segment 6 1803 the naturall tangent of the angle x c n, or x b h, giving 31 d. 43′. 3″. whose double 63 d. 26′. 6″. subtracted out 180 d. leaveth 116 degrees 33′. 54″. the inclination of the planes each to other, and subtracted out of 90 degrees leaveth 26 degrees 33′. 54″. the reclination of them. The declination of the planes is more manifestly prooved out of the body it selfe: for setting the angle H south, the side V R representeth the line of East and West, from which sides R S, and V O, of the two North reclining planes, doe decline K R V the complement of the angle S R V to 180 d. For if you suppose the line S R K, lying upon the side R V, where it hath no declination, to be moved about upon the center R, till it returne into the due position, the angle S R V shall be 180 d. 3/5 of a semicircle, subtended by the 3 sides S H, H O, and O V, containing 216 d. *by the* 11 *prop. of the* 4 *Booke of Euclide*, and K R V 72 d. the complement thereof to 180 d. which is the true declination of those two planes, and of the two inferiour opposite to them.

Now againe, suppose the sides H S, or H O, of the two South reclining planes, to lie in the prickt line S O, paralell to R V, then shall each line turning upon his center S and O, unto their due positions decline from the line S O the quantity of the angle H S O or H O S which being subtended by the lines H O,

or

of H S, containing 72 degrees, the fift part of the circle of the angle it selfe shall bee but halfe so much *by the 53 of the 1 of Pitiscus, viz.* 36 d. the declination of those two planes, and their opposites; and if the angles at O and S be but 72 d. the angle H equall to the angle R is 108 d. *by the 49 of the first of Pitiscus*: or if you suppose a Meridian line from K H to be drawn perpendicular to O S and V R the angle K H S subtended by S R, and ½ of V R is 54 d. the complement of h S O desired. Having the reclination of the North plane, the Diall to it is to be made like the second kinde of the 14. Chapter, whose houre distances from the Meridian are as followeth.

Houres and parts from the Merid.		The houre arches on the plane.		Houres and parts from the Merid.		Houre arches on the plane.	
12	0	6	48	9	3	42	12
.	½	13	39	.	3½	49	45
11	1	20	35	8	4	57	30
.	1½	27	38	.	4½	65	0
10	2	34	49	7	5	73	32
.	2½			.	5½	81	44

V R D C. North reclining	26 d. 33′. 54″.
Adding to it	38 28 0
The heighth of the stile	65 1 54
The Logar.	9957. 3875

The two North recliners and their opposites declining 72 *d.* 0′. have the same Diall serving for all foure, changing the position of the substile and houres, as is heretofore directed, and are to be made by the rules of the 20 Chapter, the particulars whereof with the houre distances are as followeth.

Houres from the Substile.	Houre arches on the plane.	Houres from the Substile.	Houre arches on the plane.
Houres.	d '	*Houres.*	d '
6 . 6	2 10	½	1 42
½	6 9	5 . 7	5 43
7 . 5	10 17	½	9 49
½	14 41	4 . 8	14 12
8 . 4	19 30	½	18 58
½	24 55	3 . 9	24 18
9 . 3	31 7	½	30 25
½	38 26	2 . 10	37 35
10 . 2	47 9	½	46 8
½	57 35	1 . 11	56 22
11 . 1	69 51	½	68 26
½	83 37	12 . 12	82 5

R S B C, and V O D E, North reclining 26 d. 33'. 54".
Declining also East and West 72 0 0.

1 The arch of the plane betwixt the Meridian and the Horizon 36 d. 0'. 0".
2 The arch of the Meridian betwixt the plane and the Zenith 58 16 57
3 The heighth of the stile or pole above the plane 31 28 20
4 The distance of the Substile from the Meridian 82 4 40
5 The angle betweene the two Meridians 85 50 41

31 *d.* 28'. 20". *the Logar.* 9717. 7414.

The two South recliners and their opposites declining, 36 d. 0'. have also the same Diall serving for all foure with the former cautions, and are to be made by the rules of the 16 Chapter, the particulars whereof with the houre distances from the Substile, are as followeth.

Houres

Houres from the substile.		Houre arches on the plane.		Houres from the Substile.		Houre arches on the plane.	
Houres.		d	′	*Houres.*		d	′
10 .	2	0	11	½		0	34
½		0	57	9 .	3	1	30
11 .	1	1	44	½		2	9
½		2	36	8 .	4	3	3
12	12	3	34	½		4	6
½		4	41	7 .	5	5	21
1 .	11	6	6	½		6	56
½		7	57	6 .	6	9	7
2 .	10	10	36	½		12	26
½		14	53	5 .	7	18	13
3 .	9	23	15	½		31	9
½		45	32	4 .	8	71	42

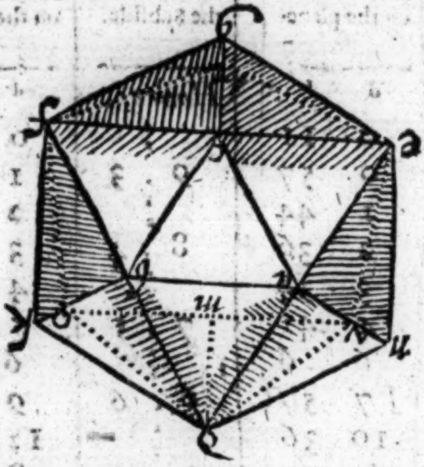
HSBA and HOEA South reclining 26 d. 33′. 54″.
Declining East and West 36 0 0

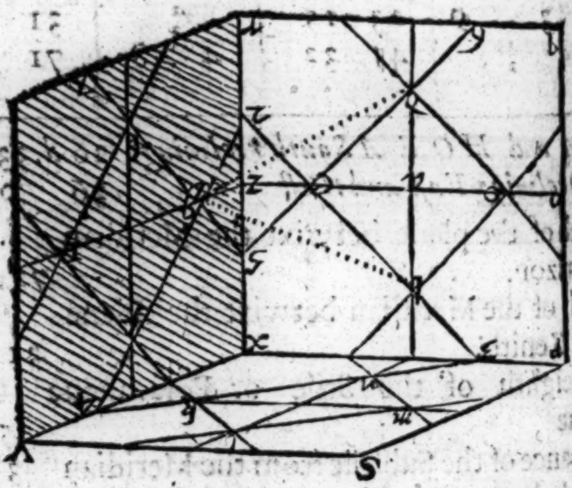
1 The arch of the plane betwixt the Meridian and Horizon. 72 d. 0′. 0″.
2 The arch of the Meridian betwixt the Plane and the Zenith. 31 43 3
3 The heighth of the Stile or Pole aboue the plane 5 44 15
4 The distance of the Substile from the Meridian 3 33 36
5 The angle betweene the two Meridians. 31 53 40

5 d. 44′. 15″. the Log. 8999. 8739.

How to cut the Icosahedrum.

The *Icosahedrum* is a solid body comprehended of twenty equall equilaterall Triangles, as are a b c, a b d, a c e, c b f, &c. There are two wayes to cut this body, the one in the very same manner as the *Dodecahedrum* was cut, drawing the parallel lines upon the *Cube* at the distance of the lesser segment, as there you draw them at the distance of the greater segment. The other way is thus; divide each side of the *Cube* p q r s v into

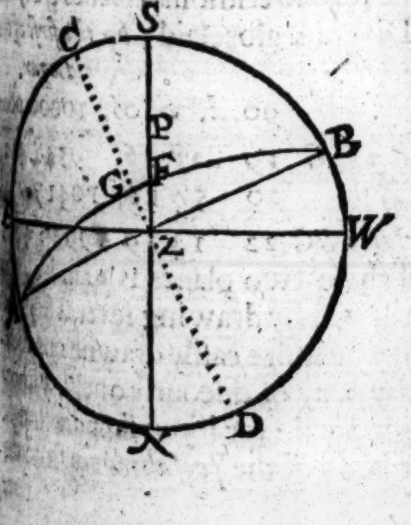




to halfes, and draw ſtraight lines, croſſing at right angles, as are bd, ce, fh, gi, km, and ln: then making po, oa halfe the ſide, the radius 100000, let ac the greater ſegment 61803 be let from a upon each middle line, to croſſe at b c d e and f g h i, &c. by each two prickes, *viz.* b e, c d, b c, and e d, draw ſtraight lines, croſſing each other at right angles, round about the Cube, ſo ſhall you have 8 equilaterall triangles, ſuch as are 234 & 567 &c. by which every corner being cut off, there will remayne ſix ſquares, ſuch as b c d e, f g h i, k l m n, and eight ſexangles, then ſhall b d be the baſe, and the point g of the next ſquare the vertex

to cut out the triangle b d g; and g i shall be the base, and k vertex to cut out the triangle g i k, and k m the base, and b vertex, to cut out the triangle k m b, and these three being ..., will leave a fourth triangle betweene them k b g, and so of the rest.

The body being thus prepared, set the angle c of the horizon- to the South, then shall a b d, be a direct North declining 81 d. ..'.23". and the opposite South inclining as much, a c e, and c b f, are two South reclining as the former, but declining also ..d. the other six planes conterminous with these three doe all recline alike 19 d. 28'.16". whereof the two Meridionall g c e, and g c f doe also decline 22 d. 14'.29", the two backward Northerne planes k b d, and h a d doe decline 37 d.45'.41".and the two intermediate Septentrionall planes b k f and a h e doe decline 82 degrees 14'.19". and as these, so doe their opposites decline and incline as much. The reclination of the three superiour planes may be proved by the Cube, whereon the body is ..t. For as the greater segment of the halfe side is the naturall tangent of an angle, the double whereof subtracted out of 90 d. leaveth the reclination of the planes in the *Dodecahedrum*, so is the lesser segment Z E or Z g in this Cube 3 8196 the naturall tangent of the angle Z a g in the Cube, or z g c in the body, 20 d. 54'.18". the arch of the Meridian betwixt the Zenith and the Plane, the complement whereof is Z c g, the angle betweene the Meridian & the Plane, supposing a perpendicular raised from g to meet with the Horizontall line in C continued, double the angle Z a g, you have 41 d. 48'.37", which taken out of 180 d. leaveth 138 d. 11'23". for the inclination of the planes, and taken out of 90 d. leaveth 48 d. 11". 23". for the reclination of a b d, a c e and c b f, the 3 supe-



superiour planes, collaterall to the horizontall. Now by h of the former arch and angle, you may alſo find the recli of the other ſix ſuperiour planes, *by the ſecond of the firſt* *R.S. triangles*, which will more plainly appeare by drawin ſeverall Scheme, (like unto this) proper to each plane, wh Z F is given the arch of the Meridian betweene the Zenith the Plane as afore, and Z F G the complement thereof the betweene the Meridian and the Plane, and the right angle to find the ſide Z G the reclination deſired, *by the ſecond of the firſt Caſe of R. S. triangles*. For

				Logar.
As the ſine of Z G F	90 *d.*	0′	0″.	10000.0000
Is to the ſine of Z F	20	54	$18\frac{1}{2}$	9552.4511
So is the ſine of Z F G	69	5	$41\frac{5}{2}$	9970.4118
To the ſine of Z G	19	28	16	$\cancel{1}$9522.8739

Wherefore 19 *d.* 28′. 16″. is the reclination of the ſix ſuperiour planes, which we ſought for.

The declinations of theſe planes may from the ſame *data* be as eaſily found, whereof a c e, and b c f, two of the ſuperiour planes decline 60 d. apiece, as is manifeſt, becauſe the Horizontall lines of thoſe two planes a c, and b c, doe decline from the line a b repreſenting the Azimuth of e and W, untill they make an equilateral triangle, a b c which is equiangled *by the 28 of the firſt of Pitiſcus*, and each angle containing 60 d. *by the 53 of the ſame*, the declination of the two Meridionall planes g c f, and g e c may be found in the Diagram aforeſaid, *by the firſt of the 13 Caſe of R.S. Triangles*.

			Logar.
As the whole ſine B G	90. *d.*	0′. 0″.	10000.0000
Is to the tang. of the reclination Z G	19	28. 16.	9548.4523
So is F S the cotangent of F Z	20	54 $18\frac{1}{2}$	10417.978
To S B the coſine of the declinatiō S C	22	14. 19.	$\cancel{1}$9966.4311

Now as the declination of theſe two planes is found by this particular Diagram, ſo may the reſt by drawing ſeverall Schemes proper to them, but they may be more eaſily drawne out the figure repreſenting the body, by way of diſcourſe onely, without further ſolution of any triangle at all; for if you ſuppoſe ſtraight lines to be drawn within the body of the *Icoſahedrum*, from the three

angles of the three ſuperiour reclining planes, they will an equilateral triangle, as is f d e, & the angles of each paire interjacent, to wit g f c, & g e c, b f k and b d k, a e h, & will be but 30 d. apiece in this plane ſuperficies, which are in the ſolid body, the ſides alſo g c, k b, and h a, ſubtending angles, will fore ſhorten proportionally, for ſeeing d g the triangle d f g, is the diameter of the circle, including al ward angles, *by the 53 of the 1 of Pitiſcus*: the angle d f g a right angle, but c f b is 60 d. one of the angles of an e- triangle, therefore g c f 30 d. the complement to 90 d. was deſired. Now if you make f c the radius, c g ſhall be tangent of 30 d. and the naturall tangent of 22 d. 14′. 19″, taken of the ſector (opened to the wideſt of c f) ſhall the pricks at r o, and V, to which ſtraight lines being drawn about the body, *viz.* from the angle f, f r, and f o: from the d o and d v: and from the angle e, e r and e v, they ſhall the horizontall lines of each ſeverall plane, as f e, b a, & the line or azimuth of E. and W, the difference betweene two lines is the declination deſired: for if the horizontall or e r, be ſuppoſed to lie upon the line e f, where it hath declination at all, and to move upon the centers e or f, into position at r, then ſhall r f c, or r e t be an angle of 22 d. 14. 19″, the declination of the two Meridian planes deſired: the horizontall line f o or e v lie upon the line e f, and from move upon the centers f and d to their due places, at c ſo and c e r ſhall be an angle of 82 d. 14′. 19″. *viz.* c b f 60 d. and b f o, or a e r 22. d. 14′. 19″. the declination of two intermediate planes deſired. Laſtly, if the horizontall o d or v d be ſuppoſed to lie upon the verticall o v, and from to move upon the centers o and v, into their due places at m o d and m r d ſhall be an angle of 37 d. 45′. 41″. the com- of m d o, or m d r, 52 d. 14′. 19″. compoſed of the two m d b 30 d. and d b o, 22 d. 14′. 19″. and therefore declination of the two Septentrionall planes deſired. Theſe thus prepared, the North reclining Diall 48 d. 11′. 23″. be made like the ſecond kind of the 14 Chapter, whoſe diſtances from the Meridian are as followeth.

Houres

Houres and parts from the Merid.	Houre arches on the plane.	Houres and parts from the Merid.	Houre arches on the plane.	Houres and parts from the Merid.	Houre arches on the plane.
Houres.	d '	*Houres.*	d '	*Houres.*	d
12 0		10 2	29 57	8 4	59
. ½	7 29	. ½	37 27	. ½	67
11 1	14 59	9 3	44 57	7 5	74
. ½	22 28	. ½	52 27	. ½	82

d b a North reclining	48 *d.* 11'. 23''.
adde thereunto	38 28 0
The heighth of the stile	86 39 23
The Logar.	9999. 2600.

The other two South reclining as much, and declining also 60 d. *viz.* b c f and a c e have the same Diall, serving for both, changing the position of the substile and houres, as is afore directed, and are to be made by the rules of the 17 Chapter, the particulars whereof with the houre distances from the substile, are as followeth.

Houres from the substile.	Houre arches on the plane.	Houres from the Substile.	Houre arches on the plane.
Houres.	d '	*Houres.*	d '
½	0 24	9 . 3	2 26
10 . 2	3 14	½	5 20
½	6 11	8 . 4	8 25
11 . 1	9 19	½	11 45
½	12 46	7 . 5	15 32
12 12	16 42	½	19 56
½	21 19	6 . 6	25 17
1 . 11	27 0	½	32 0
½	34 13	5 . 7	40 48
2 . 10	43 45	½	52 36
½	56 34	4 . 8	68 13
3 . 9	73 16	½	87 12

hef and age South reclining	48 d. 11'. 23".
Declining East and West	60 0 0

The arch of the plane betwixt the Meridian and the Horizon	37 d. 45'. 41".
The arch of the Meridian betwixt the plane and the Zenith	65 54 19
The heighth of the stile or pole above the plane	22 6 03
The distance of the Substile from the Meridian	16 41 13
The angle betweene the two Meridians	38 32 50

The two South reclining 19 d. 28'. 16". *viz.* gef and gce are also decline 24 d. 14'. 19". and are to be made by the rules of the 16 Chapter, the particulars whereof are as followeth.

Houres from the Substile.		Houre arches on the plane.		Houres from the Substile.		Houre arches on the plane.	
Houres.		d	'	*Houres.*		d	'
				½		0	11
11.	1	1	56	10.	2	2	19
½		4	7	½		4	32
12.	12	6	27	9.	3	6	53
½		9	0	½		9	29
1.	11	11	55	8.	4	12	30
½		15	24	½		16	6
2.	10	19	44	7.	5	20	37
½		25	26	½		26	38
3.	9	33	22	6.	6	35	8
½		45	9	½		47	49
4.	8	63	1	5.	7	66	58
½		87	38				

gfc and gec South reclining	19 d. 28'. 16".
Declining East and West	22 14 19

1 The

1	The arch of the plane betwixt the Meridian and Horizon.	82 d.	14'.	19"
2	The arch of the Meridian betwixt the Plane and the Zenith.	20	54	[illegible]
3	The heighth of the Stile or Pole above the Plane.	16.	22	[illegible]
4	The distance of the Substile from the Meridian	6	26	[illegible]
5	The angle betweene the two Meridians	21	49	[illegible]

The two middle Planes North reclining as much f k b, and e h a, doe also decline 82 d. 14'. 19". and are so to be made by the rule of the 20 Chapter, the particulars whereof are as followeth.

Houres from the Substile.	Houre arches on the plane.		Houres from the Substile.	Houre arches on the plane.	
Houres.	d	'	*Houres.*	d	'
½	0	19	6 . 6	2	15
5 . 7	2	53	½	4	53
½	5	33	7 . 5	7	40
4 . 8	8	23	½	10	43
½	11	31	8 . 4	14	10
3 . 9	15	6	½	18	14
½	19	21	9 . 3	23	13
2 . 10	24	38	½	29	35
½	31	38	10 . 2	38	8
1 . 11	40	42	½	50	1
½	53	37	11 . 1	66	26
12 . 12	71	17	½	87	17

k f b and a e h	*North reclining*	19 *d.*	28'.	16".
	Declining East and West	82	14	19

The arch of the Plane betwixt the Meridian and Horizon	22 d.	14'.	19".
The arch of the Merid: betwixt the Plane and the Zenith	69	5	41.
The height of the Stile or Pole above the Plane	19	53	19.
The distance of the Substile from the Merid:	71	17	90.
The angle betweene the two Meridians	83	25	34.

The other two North reclining as much *viz.* k b d and h a d doe also decline 37 d. 45'. 41". and are to be made by the rules of the 19 Chapter, the particulars whereof with the houre distances from the Substile are as followeth.

Houres from the Substile.		Houre arches on the plane.		Houres from the Substile.		Houre arches on the plane.	
Houres.		d	'	*Houres.*		d	'
½		3	12	8	4	2	14
9	3	8	41	½		7	43
½		14	19	7	5	13	19
10	2	20	12	½		19	9
½		26	24	6	6	25	17
11	1	33	2	½		31	50
½		40	13	5	7	38	55
12	12	48	2	½		46	37
½		56	32	4	8	55	0
1	11	65	44	½		64	4
½		75	32	3	9	73	46
2	10	85	44	½		83	55

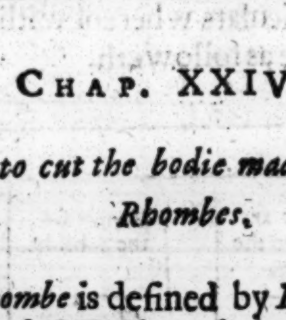
kdb *and* hda	*North reclining*	19 *d.*	28'.	16
Declining East and West		37	45	41

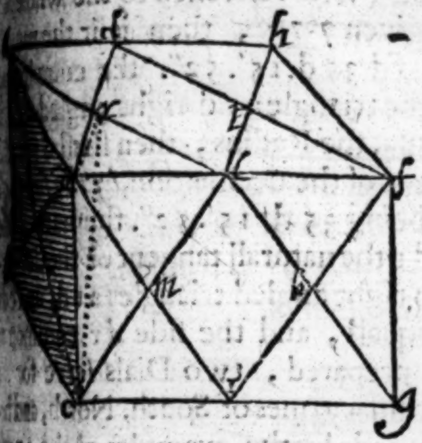
1	The arch of the Plane betwixt the Meridian and the Horizon.	75 d.	31	22
2	The arch of the Meridian betwixt the Plane and the Zenith	24	5	4
3	The heighth of the stile or pole above the plane	46	26	
4	The distance of the Substile from the Meridian	48	2	4
5	The angle betweene the two Meridians.	56	54	32

CHAP. XXIV.

How to cut the bodie made of 12 Rhombes.

A *Rhombe* is defined by *Euclide* 31 *Definition* of *the first Booke* to be an oblique Paralellogram consisting of foure equall sides, but unequall angles, as is the figure a b c d; of this plane may be composed two bodies, the one of 12 *Rhombes* as is the figure a e h, the other of 30. To cut the body of 12 *Rhombes*, you must make a paralellepiped, as a b g f. Let the length be to the breadth, or depth, as 1 to the root of $\frac{1}{2}$, so shal a h or c g be 100000 the bredth and depth a d f g equall 70710. Divide the length into two equall parts at n, l, 1 from these points draw lines





lines to the angles, and they shal include foure *Rhombes*, as are m i k l, and l p n r, &c. Draw upon each end two Diagonall lines, a c & b d, which joyning at each angle, with the lines drawne from the middle points, shall make up eight Triangles, such as is a l c, &c. cut away each corner of those triangles, *viz.* d by the triangle a l c, and f by the Triangle g l h, and so of the rest, so shall you at eight sections frame the body of 12 *Rhombes*, such as in the example appeareth.

The body being thus prepared, set the acute angle C of the horizontall *Rhombe* a b c d South, then will f h g c be a direct South, and his opposite a direct North Diall; the other are all declining alike, whereof the foure uppermost doe decline 30 d. and their opposites incline as much, as may be proved by the paralellepiped, whereon they are made; from any angle whereof as from d draw the perpendicular d r, crossing the line a l at right angles in r, then shall d r be the naturall tangent of the angle of the reclination desired; but for the more easie finding thereof, first seeke the declination of the said *Rhombe*. Suppose the side d f g c of the paralellepiped stand South, and the line l r, which is the horizontall side of the *Rhombe* c b e f, to lie upon the line d l f, representing the prime verticall, then doth it not decline at all, but moving it upon the center l, till it returne into its due position, it shall decline from d l the quantity of the angle d l a, and so much doth the line n d on the back part thereof decline from the side n a paralell to l d; wherfore in the right angled Triangles a d l, or d a n, if you make a n or l d the root of 1 to be the radius, then shall a d the root of 2. 1414 be the naturall tangent of the angle a n d, or a l d, which gives 54.d.44′. 8″. the declination desired, as in the table of naturall tangents doth appeare.

Or againe, if you take a d (with reference to the whole d f, for radius) as it is first given 70710, then is it the naturall tangent of the lesser angle a f d 35 d. 15'. 52". the complement of the former. Lastly, in the triangle a r d right angled at r, if you make a d the Hypotenusa, the Radius, then shall d r be sine of d a r, the complement of the declination, *by the first of R. S. triangles*, which being 35 d. 15'. 52". the naturall sine thereof is 57735 equall to d r the naturall tangent of the declination 30 d. because the two right angled triangles a r d, and c d r have the sides a d and c d equall, and the side d r common to both. These things being prepared, two Dials serve for the whole body (except the ordinary ones of South, North, and horizontall) which are to be made by the examples of the 17 and 19 Chapters, the particulers whereof with the houre distances from the Substile, are as followeth.

Houres from the Substile.	Houre arches on the plane.		Houres from the Substile.	Houre arches on the plane.	
Houres.	d	'	*Houres.*	d	'
½	0	42	6 . 6	4	34
7 . 5	6	0	½	9	56
½	11	24	5 . 7	15	27
8 . 4	16	59	½	21	16
½	22	53	4 . 8	27	28
9 . 3	29	12	½	34	9
½	36	2	3 . 9	41	26
10 . 2	43	31	½	49	27
½	51	44	2 . 10	58	14
11 . 1	60	44	½	67	47
½	70	28	1 . 11	77	59
12 . 12	80	48	½	88	34

The planes adjacent to the sides of the horizontall b a, c d, are

North reclining	30 d.	0'.	0".
Declining East and West	54	44	8

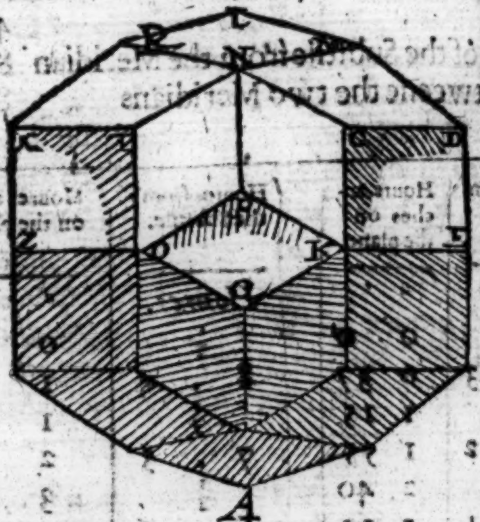
The arch of the plane betwixt the Meridian and Horizon.	54 d. 44′. 8″.
The arch of the Meridian betwixt the Plane and the Zenith.	45 0 0
The heighth of the Stile or Pole above the Plane	44 37 44
The distance of the Substile from the Meridian	80 47 51
The angle betweene the two Meridians	83 30 24

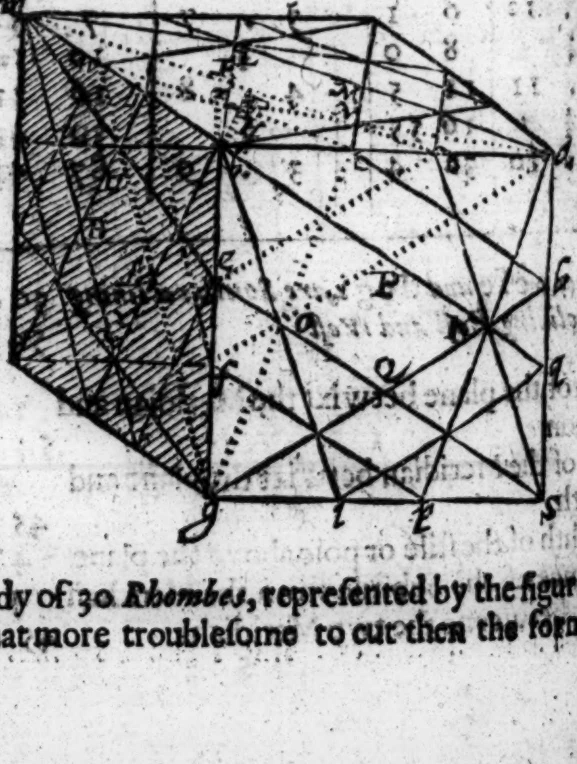
Houres from the Substile.		Houre arches on the plane.		Houres from the Substile.		Houre arches on the plane.	
Houres.		d	′	*Houres.*		d	′
½		0	0	½		0	36
9 .	3	0	37	8 .	4	1	13
½		1	15	½		1	53
10 .	2	1	55	7 .	5	2	38
½		2	40	½		3	30
11 ¼	1	3	33	6 .	6	4	34
½		4	38	½		5	57
12 .	12	6	1	5 .	7	7	52
½		8	0	½		10	54
1 .	11	11	5	4 .	8	16	31
½		16	55	½		30	49
2 .	10	32	4	3 .	9	87	43

The Planes b c f e *and* d c g i, *are South reclining*	30 *d.* 0′. 0″.
Declining East and West	54. 44. 8

1 The arch of the plane betwixt the Meridian and the Horizon	54 44 8
2 The arch of the Meridian betwixt the plane and the Zenith.	45 0 0
3 The heighth of the stile or pole above the plane	4 36 53
4 The distance of the Substile from the Meridian	4 37 48
5 The angle betweene the two Meridians	45 11 9

To cut the body composed of 30 Rhombes.





This body of 30 *Rhombes*, represented by the figure LZAE, is somewhat more troublesome to cut then the former, and is fo-

[illegible] out of the *Cube* adjoyning a m g k, dividing every [illegible] thereof by extreme and meane proportion, which is thus [illegible]ne. Let a b, b g, b m &c. be 10000, then shall a c, b d, [illegible], b f, g e, &c. be 6180 the greater segments, which taken [illegible] a sector, opened to the widest of any side, and set from each [illegible] b.g.m, &c. both wayes, shall leave a d, b c, b h, m n, b e, g [illegible] &c. 3819 the lesser segments of the same sides; from the [illegible] of the greater segments on the one side, to the lesser on the other side, draw paralell lines, as are d e, a f, b g, and q i; [illegible] them with the like paralell lines, as are c l, b q, e k, and f p; from each opposite angle b k, and a g, unto the lesser segments, opposite to the said angle, draw paralell lines as are a p, g c, b i, and k d, so have you all the lines on this side the Cube, necessary for direction in cutting this body; and thus must you doe with all the rest of the sides.

The lines being drawne as you see in the example, there are three triangles framed about every solid angle, as are the prickt lines a f h, m d e, and g n c, about the angle b, by which that angle must be three times cut, (continuing each line as part is cut away to avoid confusion) so shall you at 24 cuts, produce the body of 30 *Rhombes* the thing desired; which being prepared, set the acute angle N of the horizontall *Rhombe* thereof N M L R South, then shall the *Rhombe* O P Q K be South also, and his opposite North A B C D of the Cube (being the same in the body) West, and his opposite East, the rest are all South and North declining reclining; and as the three Rhombes O P N T, T N R X, and T X Z O, which are conterminous with the horizontall South and West planes, doe decline and recline, so doe all the rest, as from the very inspection of the body doth sufficiently appeare; wherefore having found the declination and reclination for those three planes, there is as much done as is needfull for this body.

And first for the declination of the Rhombe O P N T, whose side O P is the same with the South Rhombe O P Q K, in the triangle a f h of the Cube (which is one of the cuts of the solid angle b) producing the Rhombe aforesaid, if you suppose the line a h to lie upon the side of the Cube a b, standing South, it shall

re-

represent the prime verticall, wherein the South plane lyeth hath no declination at all: but moving it upon the center b to h, the quantity of the lesser segment $3\frac{8196}{}$, and making the Radius, b h shall be the naturall tangent of the angle which being found in the table of the naturall tangents, give the arch 20 d. 54'. 18''$\frac{1}{3}$. the declination of the Rhombe desired.

Now if you draw the perpendicular b Z from the angle b to the line of declination a h, b Z shal be the naturall tangent of the inner angle b f Z (making f b the radius) the reclination of the Rhombe desired, which is thus found *by the first Case of R. P. Triangles.*

			Logar.
As the sine of b Z h	90 *d.*	0'.	10000,00
Is to the line b h	$3\frac{819}{}$		0581,95
So is the cosine of the declination b h z	20 *d.*	54'. 18''.	9970,43
To the line b Z	$3\frac{568}{}$		0552,38

And againe in the triangle b f Z, *by the seventh Case of R. P. Triangles.*

	parts.	Logar.
As the greater segment f b	$6\frac{180}{}$	0790,99
Is to the line f b *as radius*		10000,00
So is the line b Z	$3\frac{568}{}$	0552,42
To the same line as tangent of the angle b f Z	30 *d.*	9,9761,43

The reclination desired.

Againe, in the triangle d m e, by which the Rhombe T N R X adjacent to the horizontall is cut, if you suppose the side thereof d m to lie upon the prime verticall d b, then hath it no declination, but being moved upon the center d, till it returne into its due situation at m, then shall d b be the radius, and b m the side of the cube shall be the tangent of the angle b d m, the declination of the plane, *by the aforesaid seventh Case of R. P. Triangles.*

		Logar.
greater segment db	6180	0790.99
same line db as radius		10000.00
side of the cube bm	10000	1000.00
line bm as tangent of the ... dm	58.d.16'.57'.	10209.01

...gaine, if you make the side of the *cube* mb the radius, bd ...greater segment shall be the naturall tangent of bmd 31 d. 43'. 3'. the complement of the declination sought for.

Now draw the perpendicular bf to the line of declination ...then shall bf be the naturall tangent of the inner angle of ...clination bef, making be the Radius, which is thus found in ...triangle bFd, right angled at F, *by the first Case of R. P. Triangles.*

			Logar.
...bfd the sine of	90 d.	0'	10000.00
...to the side bd	6180		0790.99
...is the sine of bdf	58 d.	16'. 57'.	9929.75
To the side bf	5257		10720.74

And againe, in the triangle bef, *by the seventh Case of R.P. Triangles.*

		Logar.
As the lesser segment be	3819	0581.95
...to the same line as radius		10000. 00
So is the line bf	5257	0720. 74
To the same line as tangent of the angle bef the reclination desired.	54 d.0.	10138.79

Lastly, in the triangle gne, by which the Rhombe ZXTO adjoyning to the West plane is cut, if you suppose the side thereof cn to lie upon the prime verticall cb, and to be moved upon the center C into its due position at n, then shall cn be paralell to dm, and so the sides and angles of the two triangles dbm, and cbn, proportionall each to other, and consequently the declination of both planes the same, which may be found *by the seventh Case of R.P. triangles.* For

		Logar.
As c b *the lesser segment*	3819	0581.
Is to c b *as radius*		10000.
So is b n *the greater segment*	6180	0790.
To b n *as tangent of the angle* b c n	58. 16'. 57".	10209.

The declination of the Rhombe desired: Or if you will make n b the radius, and suppose the line of declination n g to lie in the Meridian n b, and from thence to move upon the center n into its due situation, then shall b g the side of the Cube, become the naturall tangent of the angle b n g, yeelding the same as afore; because n b is meane proportionall betweene b g and b c. Vnto either of these lines of declination n g, or n c draw a perpendicular from b, as is b H, which will fall upon the line b f, because d m, & c m are paralels; then shall b H be the naturall tangent of the inner angle b g H, making b g the Radius, the reclination of the said Rhombe: which is thus found. In the triangle b H c, right angled at H, *by the first case of R.P. triangles.*

				Logar.
As b H c, *the sine of*	90 *d.*	0'.	0".	10000.00
Is to the line b c *the lesser segment*	3819			0581.95
So is b c H *the sine of the declinatiō*	58 *d.*	16'.	57".	9929.75
To the line b H	3249			0511.70

And againe, *by the 7 Case of R.P. Triangles.*

		Logar.
As the line g b	10000	1000.00
Is to the same line as radius		1000000
So is the line b H	3249	0511.70
To the same line as tangent of the angle b g H *the reclination desired,*	18 *d.* 0.	9511.70

These things being prepared, six Dials (besides the ordinary ones) proper to the six planes lying betweene the horizontall,

South,

[...] North, and West or East planes, serve for the whole bo-
[...] whereof three are South declining reclining, and three
[...] declining reclining alike, the first for the plane OPST,
[...] made by the example of the 16 Chapter being a South
[...] West, 20 d. 54'.18''. reclining 30 d. 0'. the particu-
[...] thereof, with the houre distances from the Substile, are as
followeth.

Houres from the substile.	Houre arches on the plane.		Houres from the Substile.	Houre arches on the plane.	
Houres.	d	'	Houres.	d	'
11 . 1	0	21	½	0	20
½	1	12	10 . 2	1	21
12 . 12	2	6	½	2	15
½	3	4	9 . 3	3	15
1 . 11	4	10	½	4	22
½	5	28	8 . 4	5	43
2 . 10	7	6	½	7	26
½	9	17	7 . 5	9	43
3 . 9	12	26	½	13	7
½	17	37	6 . 6	18	52
4 . 8	27	59	½	30	48
½	55	23	5 . 7	64	2

OPNT and KPNC South reclining 30 d. 0'. 0''.
Declining East and West 20 54. 18

1 The arch of the plane betwixt the Meridian and Horizon. 79 d. 11'.16''.
2 The arch of the Meridian betwixt the Plane and the Zenith. 31 43 3
3 The heighth of the Stile or Pole aboue the plane 6 25 3
4 The distance of the Substile from the Meridian 2 5 40
5 The angle betweene the two Meridians. 18 7 5

The

The South declining West T N R X 58 d. 16'. 57'' doth recline 54 d, and is to be made by the example of the 17 Chapter, the particulars whereof with the houre distances from the Substile, are as followeth.

Houres from the substile.	Houre arches on the plane.		Houres from the Substile.	Houre arches on the plane.	
Houres.	d	'	Houres.	d	'
10 . 2	1	42	½	1	36
½	5	4	9 . 3	4	58
11 . 1	8	34	½	8	28
½	12	20	8 . 4	12	13
12 12	16	30	½	16	22
½	21	14	7 . 5	21	4
1 . 11	26	48	½	26	38
½	33	33	6 . 6	33	19
2 . 10	41	58	½	41	42
½	52	37	5 . 7	52	14
3 . 9	65	58	½	65	32
½	81	48	4 . 8	81	17

T N R X, and C N M D, South reclining 54 d. 0'. 0'.
Declining East and West 56 16 57

1 The arch of the plane betwixt the Meridian and Horizon. 37 d. 22'. 38
2 The arch of the Meridian betwixt the Plane and the Zenith. 69 5 42
3 The heighth of the Stile or Pole aboue the plane 26 10 52
4 The distance of the Substile from the Meridian 16 29 25
5 The angle betweene the two Meridians. 33 51 33

The

South declining West OTXZ, 58 d. 16'. 57". doth al- cline 18 d, and is to be made by the example of the 16 the particulars whereof, with the houre distances from ile, are as followeth.

Houres from the Substile.		Houre arches on the plane		Houres from the Substile.		Houre arches on the plane.	
Houres		d	'	*Houres*		d	'
½		0	7	8	4	0	24
9	3	0	38	½		0	56
½		1	11	7	5	1	30
10	2	1	47	½		2	8
½		2	27	6	6	2	52
11	1	3	13	½		3	44
½		4	12	5	7	4	51
12	12	5	28	½		6	23
½		7	19	4	8	8	44
1	11	10	18	½		12	58
½		16	17	3	9	23	7
2	10	34	11	½		66	54

OTXZ, and KCDE, South reclining	18 d.	0'.	0".
Declining East and West	68	16	57.

1 The arch of the Plane betwixt the Meridian and the Horizon.	63 d.	26'.	6".
2 The arch of the Meridian betwixt the Plane and the Zenith	31	43	3
3 The heighth of the stile or pole above the plane	3	57.	40
4 The distance of the Substile from the Meridian	5	28	8
5 The angle betweene the two Meridians.	54	11.	33

The

The North declining West 20 d. 54'. 18". adjacent to the North Rhombe, doth also recline 30 d. 0'. 0". and is to be made by the example of the 19. Chapter, the particulars whereof with the houre distances from the Substile, are as followeth.

Houres from the Substile.	Houre arches on the plane.	Houres from the Substile.	Houre arches on the plane.
Houres.	d '	*Houres.*	d '
½	5 37	9 . 3	1 5
10 . 2	12 23	½	7 49
½	19 13	8 . 4	14 35
11 . 1	26 11	½	21 28
½	33 18	7 . 5	28 29
12 . 12	40 37	½	35 39
½	48 8	6 . 6	43 2
1 . 11	55 53	½	50 38
½	63 51	5 . 7	58 27
2 . 10	72 0	½	66 28
½	80 17	4 . 8	74 40
4 . 10	88 38	½	82 59

North reclining 30 d.
Declining East and West 20 d. 54'. 18".

1 The arch of the plane betwixt the Meridian and the Horizon . 79 d. 11'. 16".
2 The arch of the Meridian betwixt the plane and the Zenith 31 43 3
3 The heighth of the stile or pole above the plane 63 28 31
4 The distance of the Substile from the Meridian 40 36 56
5 The angle betweene the two Meridians 43 47 6

The North declining West 58 d. 16'. 57". adjacent to the horizontall, doth also recline 54 d. and is to be made by the ex-

[...]of the 20 Chapter, the particulars whereof, with the [...]distances from the Substile are as followeth.

Houres from the Substile.	Houre arches on the plane.		Houres from the Substile.	Houre arches on the plane.	
Houres.	d	'	*Houres.*	d	'
8 . 4	1	59	½	5	17
½	8	12	7 . 5	10	27
9 . 3	14	31	½	16	48
½	20	59	6 . 6	23	20
10 . 2	27	46	½	30	07
½	34	38	5 . 7	37	12
11 . 1	41	56	½	44	38
½	49	36	4 . 8	52	27
12 . 12	57	40	½	60	36
½	66	6	3 . 9	69	13
1 . 11	74	52	½	78	3
½	83	51	2 . 10	87	5

North reclining 54 d.
Declining East and West 58 d. 16'. 57".

1 The arch of the plane betwixt the Meridian and Horizon. 37 d. 22'. 39".
2 The arch of the Meridian betwixt the Plane and the Zenith. 69 5 41
3 The heighth of the Stile or Pole above the Plane. 55 39 21
4 The distance of the Substile from the Meridian 57 40 4
5 The angle betweene the two Meridians 62 24 28

The North declining West 58 d. 16'. 57". adjacent to the West Rhombe doth also recline 18 d. and is to be made by the ex-

example of the 19 Chapter, the particulars whereof, with the houre distances from the Substile, are as followeth.

Houres from the Substile.		Houre arches on the plane.		Houres from the Substile.		Houre arches on the plane.	
Houres.		d	'	*Houres.*		d	'
7	5	0	39	½		3	31
½		4	49	6	6	7	45
8	4	9	6	½		12	11
½		13	37	5	7	16	56
9	3	18	30	½		22	8
½		23	52	4	8	27	58
10	2	29	56	½		34	39
½		36	56	3	9	42	26
11	1	45	8	½		51	36
½		54	46	2	10	62	20
12	12	66	59	½		74	36
½		78	29	1	11	87	54

North reclining 18 *d.*
Declining East and West 58 *d.* 16'. 57''.

1 The arch of the Plane betwixt the Meridian and Horizon. 63 d. 26. 6.
2 The arch of the Meridian betwixt the Plane and the Zenith. 31 43 3.
3 The heighth of the Stile or Pole above the Plane 33 34 18
4 The distance of the Substile from the Merid: 65 59 31
5 The angle betweene the two Meridians 76 11 40

CHAP. XXV.

How to describe the Paralels of the Signes and diurnall arches upon any of the aforesaid Planes.

MAny Astronomicall conclusions may bee described upon every sort of Plane, amongst them, I have made choice of six, *viz.*

First, the paralels of the signes, shewing what part of the Zodiacke, the Sun is in at all times of the yeare.

Secondly, the diurnall arches shewing the length of the day and night throughout the yeere.

Thirdly, the azimuths or verticall circles, shewing what quarter of the World, or what point of the Compasse, the Sun is in at any time of the day.

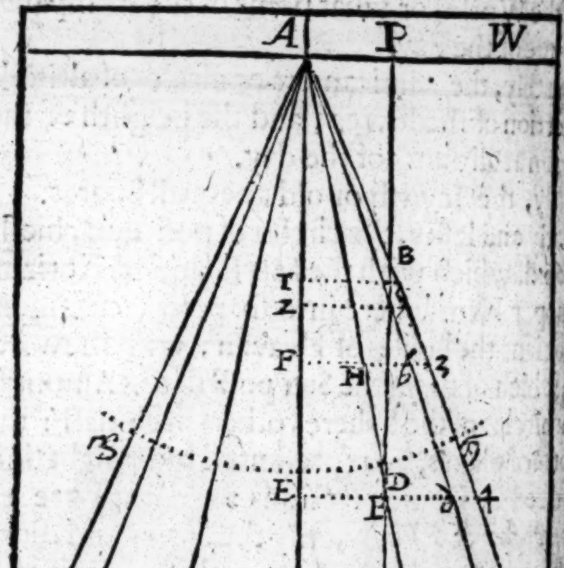
Fourthly, the Almicanters or circles of altitude, shewing the proportion of shadowes, and the heighth of the Sun above the Horizon at all times of the day.

Fiftly, the Iewish or old unequall houres.

Sixtly and lastly, the circles of position, chiefly those of 30 d. and 60 d. which with the Meridian and Horizon distinguishing the upper Hemisphere into six parts, commonly called by Astrologians the houses of Heaven, will shew at all times of the day, which of them the Sun possesseth. Amongst these some are great circles of the Sphere, others are small; the great circles in all sorts of planes, are represented by straight lines, the smaller are described by Conick sections: and they are either *Parabolas*, *Hyperbolas*, or *Ellipses*, only the signes and diurnall arches in the polar, and the almicanters or circles of altitude in the horizontall, are perfect circles.

Polar.

Now there are three various descriptions of these p[...] according as the planes (on which they are projected) do [...] axis of the World, rightly obliquely; or are paralell there to, [...] begin with the easiest, which is the polar plane, in which the [...] being cut at right angles, the houre lines doe meet with [...] angles in the centre, representing the pole of the World, [...] paralels described upon the pole, must therefore of necessity [...] greeable to the Globe) be perfect circles, least about the c[...] and greatest neere the periphery or limbe: the stile of this D[...] may be any streight prime, or wyer, whose length in respect [...] the houre lines is arbitrary, but the apex or top thereof, giv[...] shadow upon the circles of declination, will enforce a propor[...] tion between the length of the stile, and greatnesse of the plan[...]



ficiently declared in the ninth Chapter aforesaid: where-
make the *Trigone* A ♑ ♋, let the middle line thereof
represent the Epuinoctiall, the rest the declinations of the
♉, ♊, ♋, ♓, ♒, ♑, and their opposites) set off by the helpe
chord both wayes from E, the distance of 11 d. 31′. 20 d.
and 23 d. 31. the arches of declination, and draw straight
A thorough those points. Let A P equall to C B, the
the stile in the Diall of the 14 Chapter, drawne per-
to A E, be given in some knowne parts, suppose 37
parts of an inch, from P draw P D paralell to A E cros-
the signes in B C D; the semidiameters of those paralels are
C, and P D, which I desire to know; In the triangles
A P C, and A P D, the angle at P is a right angle, the an-
at A are the complements, and the angles at B, C, and D, are
declinations themselves of ♋ ♊ and ♉ &c. wherefore *by the*
Case of R. P. Triangles.

		Logar.
As the sine of A D P *the declination of* 0 *d.* ♉	11. 31′.	+9300.28
Is to P A *the length of the stile in parts*	37	0431.80
So is the sine of D A P, *the compllement of the declination*	78 29.	9991.17
To the line P D *the Semidiameter of the circle of declination, for* 0 *d. of* ♉.	181	0259.09

In like manner you may find P C to be one inch, and P B 85
hundred parts of an inch, wherefore take of a scale of inches,
85, 100 and 181. and at those lengths draw the circles in the
Diall of the 14 Chapter ♉ A ♍, ♊ 60 ♌, ♋. 15 ♋, so have you
the paralels of the Northerne signes for the upper face of this
plane, unto which the Southerne paralels in the nether face are
equall: and thus may you, if you thinke fit, put on all the decli-
nations betweene ♉ and the center.

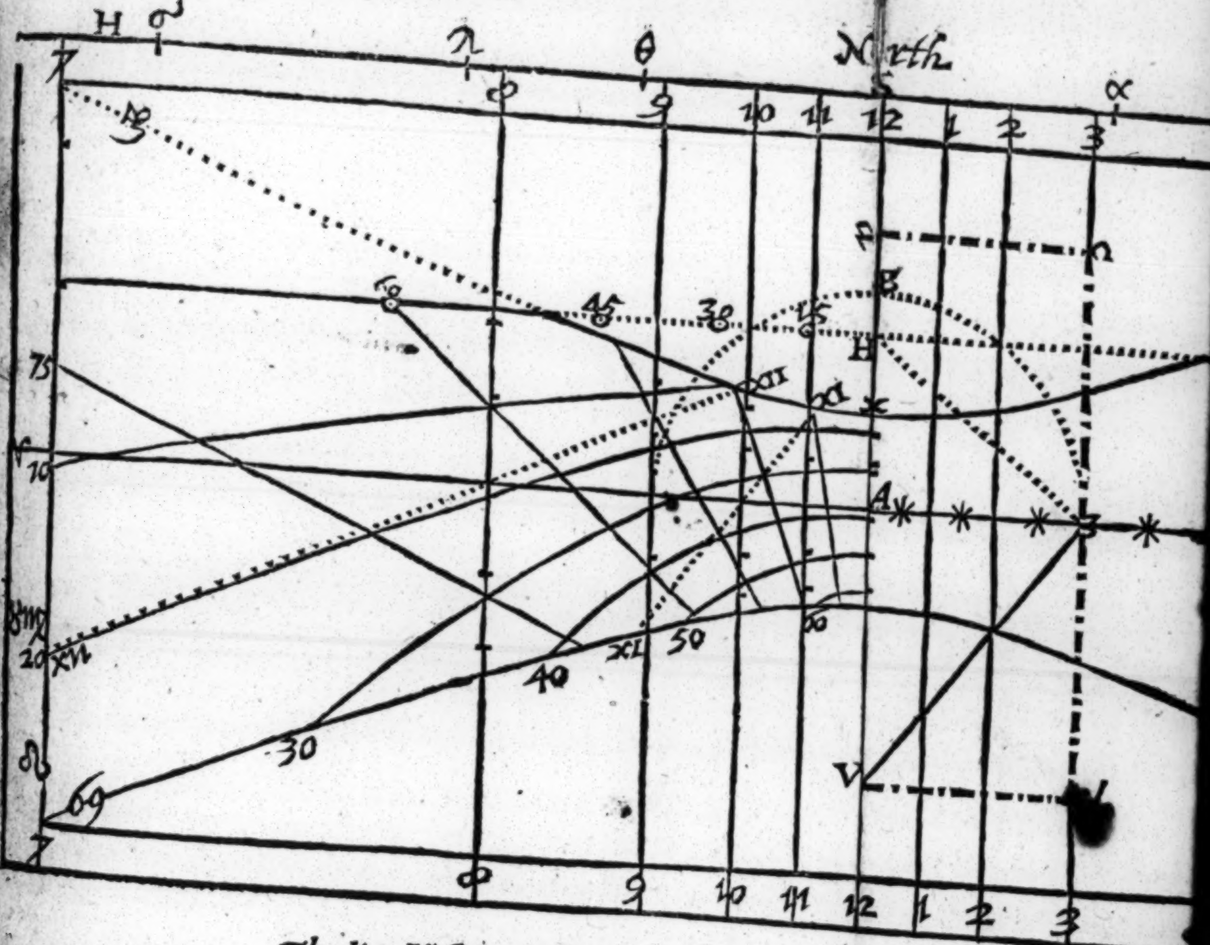
But if you will worke by naturall tangents, you need not the
solution of any triangle, because P D is a tangent line to A P. Let
A P equall to the stile be radius, supposed to be divided into 100
1000. or 10000. parts, then is P B 2298 P C 2715 and P D 4903

the naturall tangents of the complements of the declina[illegible] ♋ ♊, and ♑ *by the second case of R. P. triangles.* Where[illegible] viding a line equall to the Radius A P (*as in the first C*[illegible] or opening the Sector to the widest of A P, you may [illegible] these tangents, which are the Semidiameters of the de[illegible] ons, and with them draw the circles aforesaid without [illegible] culation at all.

CHAP. XXVI.

The second sort: East and West Equinoctiall reclining, Equinoctiall reclining declining.

THe next sort of planes are such as [illegible] Æquator at right angles, and there[illegible] are paralell to the axis, as are the Ea[illegible] West direct, the Equinoctiall rec[illegible] and declining reclining to the pole[illegible] these the paralels of the signes and [illegible] nall arches are those Conicke Secti[illegible] which are called *Hyperbolas*, and ma[illegible] as easily inscribed as the former, yet herein also, because the [illegible] pex or top of the stile (or some Nodus equivalent in the [illegible] stile) doth shew the paralels drawn upon these kinds of Dia[illegible] must of force proportion the stile to the plane (as is at large [illegible] coursed in the ninth Chapter.) Let A W in the Diagram afore[illegible] said be equall to A L, and A B, the length of the stiles, in [illegible] Dials of the ninth and thirteenth Chapters; which being [illegible] the Radius, set the distance from the top of the stiles at L and B [illegible] to the intersection of the houre lines and Æquator (which [illegible] call the secant of each houres distance) from 6 or 12 of clock, re[illegible] spectively, in the Dials of the aforesaid Chapters downwa[illegible] from A, in the line A E ♈ of this Scheme; so shall A F be the [illegible] cant of 45 d. 1 414. equall to L 9. and B 3. and so shall A [illegible] the secant of 60 d. 2 000 equall to L 8, and B 4 in the Dials [illegible]



The line H S K *should be joyned to the former Scheme, as a Tang*

Place this folio 269.

...le and intersection of each houre line upon the Æquator) ...pendiculars crossing the paralelles of Declination, are ...gent lines to them, as f 3 to a f, and E 4 to A e, and

 con-

s of the complements of the declinati
second case of R. P. triangles. Wherefo
to the Radius A P (as in the first Ch
or to the widest of A P, you may
ich are the Semidiameters of the dec
draw the circles aforesaid without an

CHAP. XXVI.

rt: East and West Equinoctiall reclining,
uinoctiall reclining declining.

He next sort of planes are such as cu
Æquator at right angles, and therefo
are paralell to the axis, as are the East
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and declining reclining to the pole.
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nall arches are those Conicke Sectio
which are called *Hyperbolas*, and may
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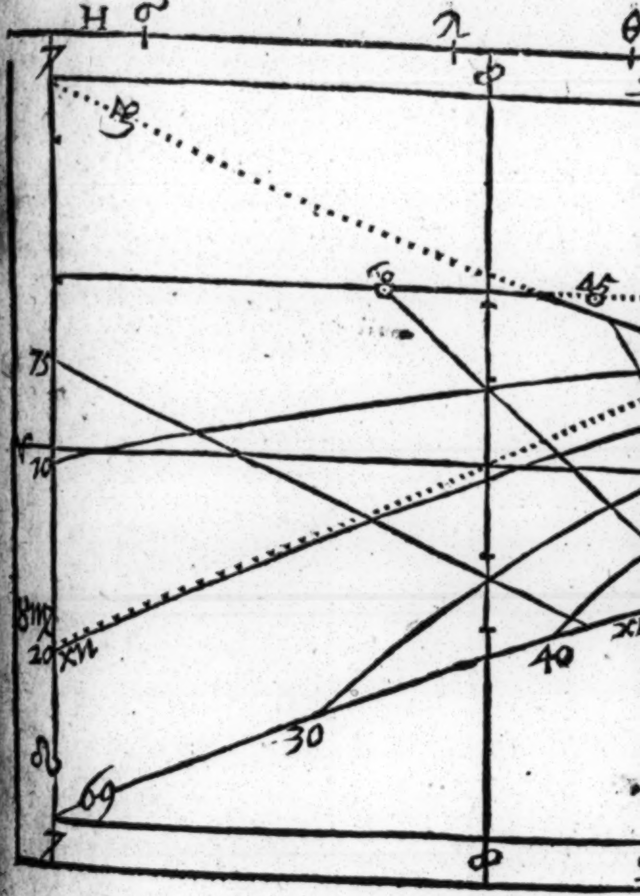
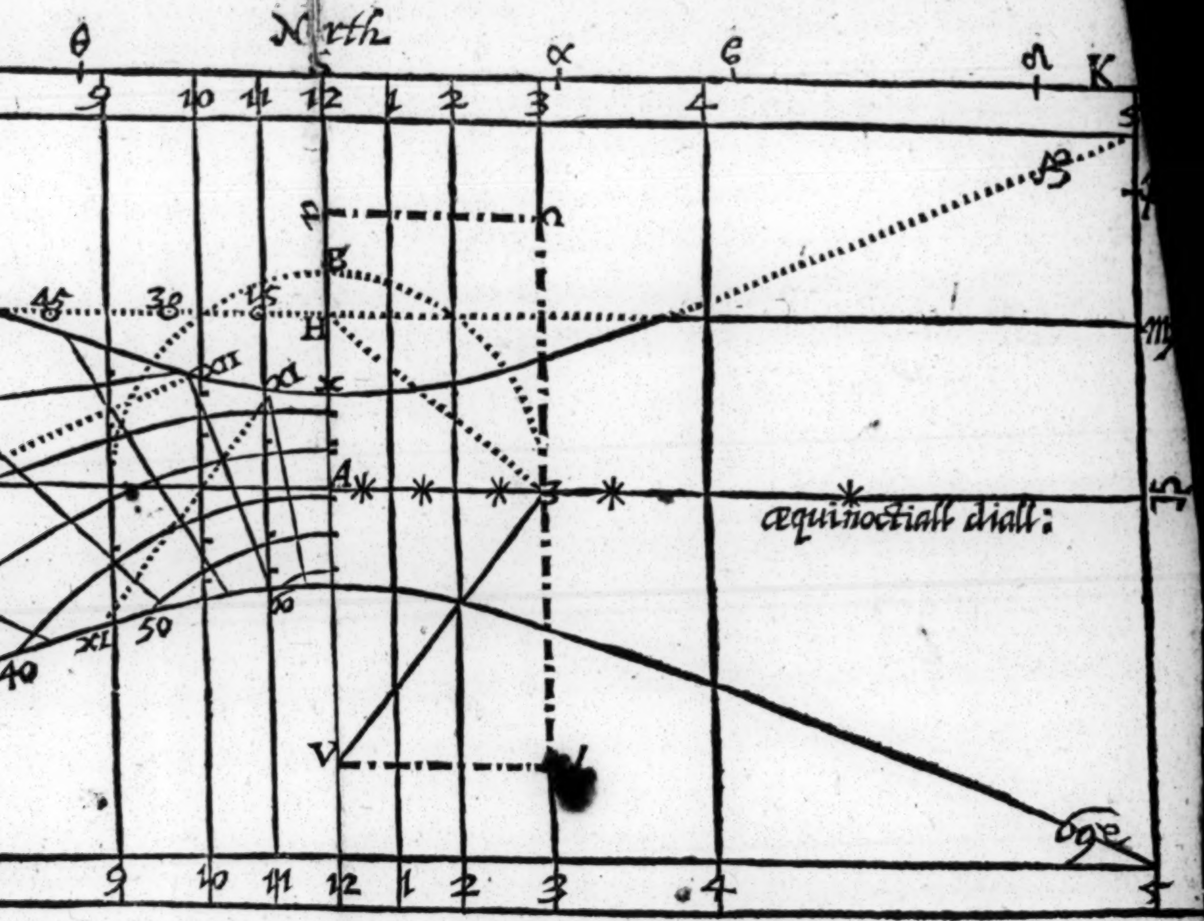
paralels drawn upon these kinds of Dials,
tion the stile to the plane (as is at large
Chapter.) Let A W in the Diagram afor
, and A B, the length of the stiles, in th
nd thirteenth Chapters; which being ma
istance from the top of the stiles at L and
of the houre lines and Æquator (whic
h houres distance) from 6 or 12 of clock,
ials of the aforesaid Chapters downwa
A E ♈ of this Scheme; so shall A F be th
equall to L 9. and B 3. and so shall A
ooo equall to L 8, and B 4 in the Dials afor



The line H S K *should b*

Plac

... and intersection of each houre line upon the A
... perpendiculars crossing the paralelles of Declinati
... lines to them, as f 3 to a f, and E 4 to A



should be joyned to the former Scheme, as a Tangent line at S.

Place this folio 269.

on the Æquator)
Declination, are
E 4 to A e, and
con-

from A, in the line A E F of this Scheme; so shall A F be the se-
cant of 45 d. 1414. equall to L 9. and B 3. and so shall A E be the secant of 60 d. 2000 equall to L 8, and B 4 in the Dials afore-said

&c. by which points F 3, and E 4 draw paralels to A P W perpendiculars to A E ♈, and they shall represent the houre 9 and 3, and 8 and 4 in the Dials, crossing the paralels of signes at H b 3, and c d 4 in the Diagram, at the same distances from F and E, that the houre lines doe in the Dials from Equinoctiall lines thereof; which distances are thus easily found in the triangles A E c, A E d, and A E 4, the angle at E is a right angle, the angle at c d 4 are the complements and the angles at A the declinations themselves of ♉ ♊ ♋, and the side A E the secant of 60 d. the houre of 4. of clock, which in the Tables you shall find to be 2000 the double of the Radius AW, whereby the second *Case of R. P. triangles.*

			Logar.
As the sine of the angle A c e	78 *d.*	29'.	0008.82. *Ar. compl.*
to the line A E	2000		0301.03.
so is the sine of the angle e A c	11	31	9300.27.
to the line e c *the distance of the paralels from the Æquator*	04	07	09610.12. *Compl. Charact.* o.

In like manner you shall find the paralell of ♊ to be 736, and the paralell of ♋ to be 870 from the Æquator upon the foure of clock houre; wherefore if you open the Sector to the widest of AW (or divide a line equall thereto) and take of either line the distances aforesaid, and set them both wayes upon the houres of 8 and 4 in the Dials, you have points in those houre lines, by which the paralels of the signes shall passe; doe the like with the rest of the houre lines in all respects.

But if you wil work by naturall tangents, you may with much more ease and speed performe the same: for making the secant of every houre from 6 or 12 of clocke respectively, to be a severall Radius (which is the distance betweene the top of the stile and intersection of each houre line upon the Æquator) the perpendiculars crossing the paralelles of Declination, are tangent lines to them, as f 3 to a f, and E 4 to A e, and con-

consequently the distances are ready given in the Table of naturall sines and tangents, without any calculation at all, you may collect into a table in this manner; so making radius, which is the secant of 45 d. for three of clock 1000, is the naturall tangent of 11 d. 31′ 204, and F B is the naturall tangent of 20 d. 13′, 368, and F 3 the naturall tangent of 31′ 435; In like manner A E being the radius, which is the secant of 60 d. for 4 of clock 2000. E c, E d, and E 4, are the tangents againe, onely the radius increased, and so of the rest of the houres; by helpe of the line divided equall to the radius by the sector, set these tangents both wayes from the Equinoctiall line of the Dials upon each correspondent houre line (as you see done in the example of the 13 Chapter) where they are prickt out (but not drawne to auoid confusion) so shall you have points, which drawne together into one continued circular line shall give the paralels desired.

Houres.		*Equinoctiall distances.*		*Tangents.*	*Secants.*
12	6	d	′		
11 1	7 5	15	0	268	1045
10 2	8 4	30	0	577	1155
9 3	9 3	45	0	1000	1414
8 4	10 2	60	0	1732	2000
7 5	11 1	75	0	3732	3864

CHAP.

Chap. XXVII.

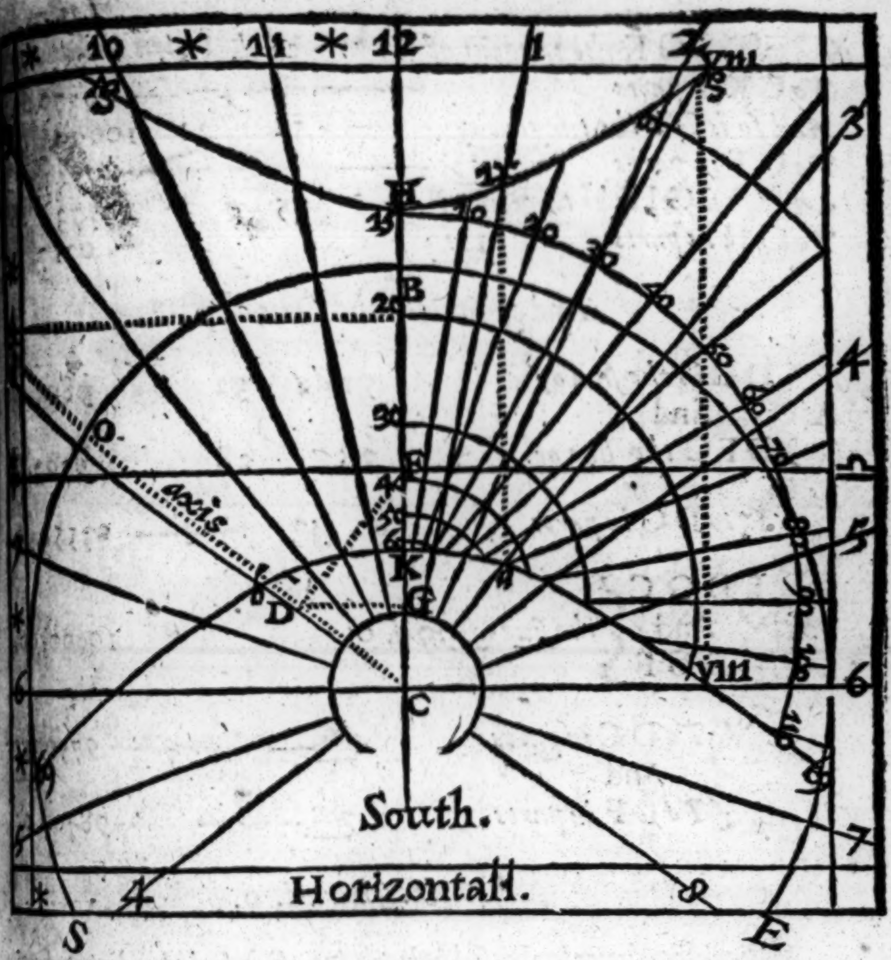
The third sort Horizontall South and North direct, declining, declining reclining.

OF the third sort are the rest of the planes, which cutting the axis obliquely, have all the houre lines meeting in a center upon the axis with unequall angles, as in the Horizontall, South and North direct, declining, or declining reclining; in all which the paralels of the signes, and diurnall arches are conick sections, but not ...pes the same. Now because the top of the perpendicular ...or some nodus equivalent in the trianguler stile, supposed ...in the center of the earth, doth give shadow to these pa...s, (as in the former sorts) it will be necessary to shew, how ...proportion the perpendicular stile to the plane, or to find the ...of the Nodus in a trianguler stile, there being no mention ...of needfull before, in projecting the houre lines upon any ...these sorts or planes; First therefore assigne the place of the ...pique, furthest distant from the center, most convenient for ...plane, upon the 12 of clock houre or Meridian of the place, ...directs, but upon the Substile or Meridian of the plane in ...the rest. Let that be H in the horizontall for ♑, two inches ...stant from the center C, next seeke the Meridionall heighth of ...the Sun in each tropique upon the planes, which is alwayes ...thus found: The heighth of the pole or stile above the plane be...ing given 51 d. 32'. the heighth of the Æquator is the comple...ment thereof 38 d. 28'. unto which adde and substract 23 d. 31. ...so have you 61 d. 59'. the heighth in ♋, and 14 d. 57'. the ...heighth in ♑. This done, suppose D G in the Dials of the sixt ...and seventh Chapters to be the perpendicular stile, whose length ...I would know it is manifest *by the second Case of R.P. triangles*, ...that if D G be radius 1000, C H is a tangent line thereunto, and GC is 794 the naturall tangent of 38 d. 28'. the complement of

the elevation, and G H is 3745 the naturall tangent of 75 d. the complement of the Meridionall heighth of the Sunne in which added together, give the whole line C H 4539 parts of the Radius D G, wherefore divide the Radius 10000 (increased with cyphers) by the number 4539, and the quotient will yeeld 220 (as in the 9 Chapter more at large) or without any other labour seek the Arithmeti: complement of the Log. 4539 in the *Chiliades*, which is 0343.03. & it shall give 2203, as aforesaid: This being found, divide a line equall to C H into 100 parts (as in the first Chapter) or open the Sector to the widenesse of C H, and take of either 22 hundred parts, which is the length of the perpendicular stile D G, and must be the Radius for the rest of the worke: to which widest againe a line divided, or the Sector opened, take of 791, the naturall tangent of 38 d. 28'. which set from C to G, shall give the place of the stile; from G to the axis C D draw a paralell to 6 C 6, which shall be the perpendicular stile desired; from G to K set the naturall tangent of 28 d. 1', 532, the cōplement of the Meridional heighth of the Sun in ♋, and K shall be the point for ♋. From G to F set the naturall tangents of 51 degrees, 32', 1259 the heighth of the pole above the plane, and by F draw the straight line ♈ F♎, parallel to the houre of 6, for the Equinoctiall; From G to H set the naturall tangent of 75 degrees, 3'. 3745 the complement of the heighth of the Sunne in ♑, and it shall fall upon the point H formerly assigned. Lastly, C D is 1277 the secant of 38 degrees 28'. which giveth the place of the Nodus in the Trianguler stile, and D F is 1607 the secant of 51 degrees 32'. If you like better to worke by a scale of inches, or for more certainty sake will joyne them together, then must you resolve many triangles to find these things, and first for the length of the stile.

		Logar.
As the tangents of C G *and* G H	4539	+0656.96
Is to the line C H *in inches*	2000	+0301.03
So is the Radius D G		+10000.00
To the line D G *in parts of an inch*	440	—9644.07

Complement Charact. 0.



The length of the stile being found in parts of an inch, then by the 2 Case of R. P. Triangles.

		Logar.
As DG the Radius		+10000.00
Is to DG in parts	410	0355.93
So is GC the tangent of	38 d. 28'	+9900.09
To GC in parts	350	9544.16

Comple: charact. 0.

And

				Loga.
And so is G K *the tangent of*		28 *d.*	1'.	9725.98
To G K *in parts*	234			9370.0
And so is G F *the tangent of*		51	32	10099.9
To G F *in parts*	554			9743.98
And so is G H *the tangent of*		75	3	10573/46
To G H *in parts*	1650			0217.53

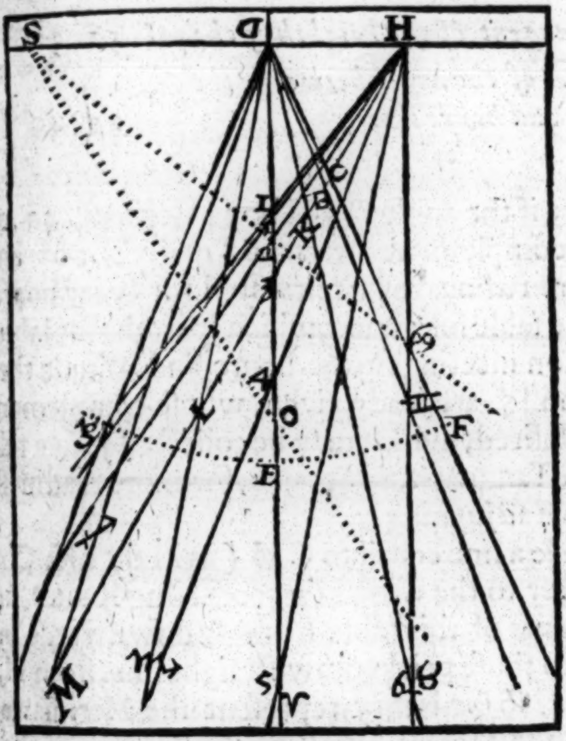
And againe, *by the same case.*

As { D C G *the sine of* And	51 *d.*	32	9893.74
D F G *the sine of* }	38	28	9793.83
Is to D G *in parts*	440		0355.93
So is { D G C And D G F } *the sine of* 90 *d.* 0'.			10000.00
{ *To* D C *in parts* And	562		9750.33
To D F *in parts* }	708		9850.24

Comple. Charact. 0.

Wherefore by a scale of inches, set of 35 hundred parts from C to G, and 23 hundred parts from G to K, and 55 hundred parts from G to F, and 165 hundred parts from G to H, and 56 hundred parts from C to D, and 71 hundred parts from D to F, and you shall find them justly to agree with the naturall tangents and secants aforesaid. This being done, returne to the trigone C F ℭ, remayning the same with the former, crosse the middle line thereof C E at right angles in C, and let C H representing the axis of the stile, be equall to C D, and D C to D F of the Diall; Make D F the radius (which is evermore the secant of the heighth of the pole above the plane) and to that wideth open the

the Sector, then shall C 1. C 2. C 3. C 4. and C 5. be the Secants of 15 d. 30 d. 45, 60. and 75 d. the Equinoctiall distances of each houre from 12. by which you may pricke downe the houre distances from C upon the Æquator in the trigon.



Or rather making H C of the trigon the radius, equall to C D the axis of the stile in the Diall, which is the secant of 38 d. 28'. (evermore the complement of the heighth of the pole above the plane) C E shall be a tangent line to it: and to that wideth open the Sector or divide a line as aforesaid) then shall C D, C 1. C 2, C 3. C 4. and C 5. be the naturall tangents, and H D, h 1. h 2. h 3. h 4. and h 5. shall be the secants of the complements of the houre arches at H, and are easily found *by the first and second varieties of the second case of R. S. triangles.*

For

			Logar.
As the whole sine of	90 d.	0	10000.00
Is to the Cosine of 60 for 4 of clock, or of any other houres distance from 12.	60	0	9698.97
So is the cotangent of the heighth of the pole	51	32	9900.09
To the tangent of the angle betweene the Æquator and houre line	21	40	9599.06

Wherefore if the angle C 4 H be 21 degrees, 40'. the angle C H 4 is the complement thereof 68 degrees 20'. but because this were very tedious to be reiterated for every houre, I have calculated the table following, which spareth that labour, where in the common meeting of the houre and latitude the angles at D. 1. 2. 3. 4. and 5. are ready given, whose complements are the angles at H desired, which may be collected into a table, with their naturall Tangents and Secants, for more readinesse sake, as in the example adjoyning.

Now divide a line equall to C H (as in the first Chapter) or open the Sector to the widest thereof, being Radius, and set the severall tangents of this table from G downwards in the line C E ♈, and to those pricks draw straight lines from H, passing by D. 1. 2. 3. 4. so shall they represent the Meridian and houre lines on each side thereof, crossing the signes upon the Trigon.

Houres.		*Angles at the Equator.*		*Angles at H.*		*Tangents*	*Secants.*
		d	'	d	'		
12	0	38	28	51	32	1258	1607
11	1	37	30	52	30	1303	1643
10	2	34	32	55	28	1453	1764
9	3	29	20	60	40	1781	2042
8	4	21	40	68	20	2517	2708
7	5	11	37	78	23	4854	4966

the same distances from H, that their paralels will doe from the center of the Diall; if you like to put on these houre lines by a scale of Inches, worke *by the second Case of R.P. Triangles.*

		Logar.
As CH *the radius in the trigon*		+ 10000.00
Is to the line G H *equall to* C D *the axis of the stile*	562	0250.27
So is C 4 *the tangent of the angle* G H 4	68 *d.* 20'.	+10400.91
To the line C 4 *in like parts of* C H	1415	+0150.64

Therefore C 4 is one inch and 42 hundred parts next hand; and so of the rest.

Now if these lines be presumed to be truly drawne without errour, (which is hard to doe) you may from this Trigon thus drawn, prick down the paralels upon the Dials: but for the arithmeticall worke (which I rather wish you to trust to) it were sufficient to draw these lines by hand, somewhat neere the matter, onely to helpe the fancy in the rest of the worke, which is this; In the triangles C G H, C B H, C K H, and C L H &c. the angle at C is alwayes given lesse then 90 d. in the signes betweene H and the Æquator, and more then 90 degrees in the rest, the quantity of each paralels declination; the angles at H are found in the table aforesaid, and the angles at G. B. K. and L, are the complements of them both to a Semicircle, which being found, the proportion is plaine, *by the first case of O.P. triangles:* For as the signes of C G H, C B H, C K H, and C L H, are to the line CH 562 in parts of an inch: or rather to the Radius, 1000, so are the sines of the Diall upon the houre lines of 3 and 9; for more plainnesse thus.

	Logar.	
The angle C H G *is*	60 *d.*	40
The angle H C G *the complement of the declination*	66	29
Added together	127	9
Therefore C G H *the complement to* 180 *d. is*	52	51

			Logar.
As the sine of the angle C G H	51 *d.*	32'.	9901.49
Is to the line C H	1000		0000.00
So is the sine of the angle G C H	66	29	9962.34
To the line H G	1150		0060.85

From

From a line divided equall to C H, or off the sector (opened to that widest) take 1 length, and 15 hundred parts of another, which set from the center of the Diall, shal give the points and b upon the houre lines of 3 and 9 of clock of the horizontall in the tropique of ♋, do the like with the rest, varying the angle C according to the declination of the paralell, which is alwayes acute for the signes betweene the point H and Æquator, and obtuse in the rest; you may yet shorten this worke after this manner, and either calculate the distances of all the paralels at once upon each houre line by it selfe, or of each paire of paralels upon all the houres together; as in these examples following.

The angle C 3 H, in the table above written is	29 *d.* 20′.		*Cosines.*
The declinations of the paralels with their Cosines.	23.	31	9962.34
	20.	13	9971.38
	11.	31	9991.17
			Arith. Compl.
The arch of the houre added to the declination with the Arithmeticall Complement of each sine, to auoid subtraction.	52 *d.*	51′.	0098.61.
	49.	33	0118.63.
	40.	51	0184.36.

Distances from H. or from the center of the Diall.

		Logar.
1150	♋ HG	10060.85
1235	♊ ♌ HB	10091.01
1498	♉ ♍ HK	11175.53

The declinations subducted out of the arch of the houre with their Arithmeticall Complement also.	05 *d.*	49′.	0994.19.
	9	7	0800.11.
	17	49	0514.31.

9048	♑ HN	10956.53
5922	♐ ♒ HM	10772.49
3102	♍ ♓ HL	10505.48

Adde

Adde the Cosine of 11 d.31'. unto the Arithmeticall Complement of 40 d. 51'. and 17 d.49'. so have you new Logarithmes, which found in the *Chiliades*, gives 1498 for HK the distance of ♉ and ♍, and 3102 for HL, the distance of ♏, and ♓, doe the like with the Cosine of 20 d. 30'. for 49 d.33'. and 9 d.7. as also with the Cosine of 23 d. 31'. for 52 d. 51'. and 54.29'. so have you the distances of the rest of the signes, *viz.* HG for ♋, 1150 and HN for ♑ 9048, HB for ♊ ♌ 1237, and HM for ♐ ♒ 5922, all which being set from the center of the Diall C upon the houre lines of 3 and 9 give you points for the paralels of the signes in those two houre lines; and the like must be done for the rest.

In calculating each paire of paralels together, you may make use of the former table, which here I transcribe.

Houres.		*Angles at the Equator.*		*Angles at H.*		*Tangents*	*Secants.*
		d	'				
12	0	38	28	51	32	1258	1607.HD
11	1	37	30	52	30	1303	1643.H 1
10	2	34	32	55	28	1453	1764.H 2
9	3	29	20	60	40	1781	2042. H 3
8	4	21	40	68	20	2517	2708. H 4
7	5	11	37	78	23	4864	4966. H 5

Then adde 23 d. 31'. the declination of ♋ and ♑ unto each houres arch, and subduct it from them, unto the Arithmeticall Complements of the new arches made by addition and subtraction, adde the cosine of the declination (so have you new Logarithmes, which found in the *Chili ades*, will give the distance of those two paralels upon each houre line from the center of the Diall. But if the Diall have no center upon the plane (as in the example of the 11 Chapter) or that the lines be to long from the

	d	'	Arith. Complement.	Logarith.	Lines from the Center.	Lines from the Equator.	Hours
Declination of ♋ and ♑.	23	31	9962.34	Cosine.			
Added to each hou. arch composeth these,	35	8	0239.96	10202.30	1593	3373	7 5
	45	11	0149.13	10111.47	1292	1416	8 4
	52	51	0098.51	10060.85	1150	0890	9 3
	51	3	0071.33	10033.67	1081	0683	10 2
	61	1	0058.11	10020.45	1048	0595	11 1
	61	59	0054.17	10016.47	1039	0568	12 0
And subducted out of the same, leaveth these.	5	49	0994.19	10956.53	9048	7006	9 3
	11	1	0718.75	10681.09	4798	3034	10 [illegible]
	13	59	0616.83	10579.17	3795	2151	11 1
	14	57	0588.42	10550.76	3554.H.♑	1947.D.♑	12 0

the center, abate the lines of each houre from the center, as for 12, 1039, with the rest belonging to ♋, out of the secants of the same houres above written; which are the distances from the center to the Æquator: and the secants themselves, out of the distance of the houres, as for 12, 3554 with the rest of the lines belonging to ♑. So shall you have new lines to be set both wayes from the Equinoctiall, as formerly from the center; Thus if you take H 3 of the trigone 2040, out of H L 3202, there will remaine 3 L, 1160, from the Æquator to m, and if you take H D. 1007 out of H ♑ 3554, there will rest D ♑ 1947, the distance of ♑ from the Æquator upon the 12 of clock houre; and so of the rest. The paralells upon the 6 of clock houre, H S are the very same with the polar, whose distances from the center are H ♋ 219. H ♊ 271, and H ♉ 491, the naturall tangents of the complements of the declinations of ♋ ♊ and ♉ making C H the Radius. Of all which I have discoursed the more at large, because the same rules will serve in the rest that follow.

South West, North direct.

In South and North planes the heighth of the stile or pole a-
bove the plane is the complement of the former above the Hori-
zon therefore C H 2 Inches the distance of ♋ from the center,
in the Diall of the seventh Chapter, be thought convenient for
the plane, first find out the length of the perpendicular stile G D,
before, which being Radius, G C shall be 1259 the naturall tan-
gent of 51 d. 32′, and G H 1879 the naturall tangent of 61 d.
59. the Meridionall heighth of ♋, (because C H is a tangent
line to the Radius D G.) Wherefore

		Logar.
As C H both tangents together	3138	+ 0496.65
Is to C H two inches	2 *in:*	+ 0310.03
So is G D the Radius	1	+ 0000.00
To G D in hundred parts of an inch	650	9813.38
Comple. Charact.		o.

Or you may find the length of G D by the Arithmeticall com-
plement of 3138 as before; take 65 hundred parts of a scale of in-
ches, and open the Sector to that widest, then set 1259 the
naturall tangent of 51 d. 32′. from C G, and by it draw the per-
pendicular stile G D, paralell to 6 C 6; set 267 the naturall tan-
gent of 14 d. 57′. the meridionall heighth of ♑, from G to K,
and K shall be the point, by which the paralell of ♑ shall passe:
set 764, the naturall tangent of 38 d. 28′. from G to F, and by F
draw a paralell to 6 C 6, which shall be the Equinoctiall: set
1879, the naturall tangent of 61 d. 59′. the Meridionall heighth
of ♋, from G to H. and H shall be the point, by which the pa-
ralell of ♋ shall passe.

This done, returne to the trigone, and supposing the houre
lines of the horizontall to be taken of, let C S be equall to C D,
the axis of the stile of the South Diall, and C 2 equall to D F the

Radius of the Æquator thereof; out of the table following take the angles of the houre arches, under the latitude of 38d. 28. (which is the heighth of the ſtile above this plane) and collect them, with their naturall tangents, and ſecants into a table, for more eaſe ſake, as in the example.

Houres.		*Angles at the Æquator.*		*Angles at S.*		*Tangents.*	*Secants.*
		d	'	d	'		
12	0	51	32	38	28	794	1277
11	1	50	30	39	26	822	1295
10	2	47	28	42	32	917	1357
9	3	41	39	48	21	1124	1505
8	4	32	11	57	49	1589	1877
7	5	18	2	71	58	3072	3227

Then making C S Radius, C E ſhall be a tangent line to it: wherefore ſet the tangents of this table from C downwards, upon the line C E ♈, and you ſhall have pricks therin, by which ſtraight lines drawne from S (as is the prickt line S 2, for 11. and 1 of clocke, and S O for 8 and 4 of clocke) ſhall give the houres of the South Diall, croſſing the paralels upon the trigon at the ſame diſtances from S, that they will doe from the center of the Diall, the length of which lines are to be found in all reſpects as the former were, and therefore needleſſe to repeate the worke againe.

South and North recliners.

In South and North recliners, the rules of the horizontall doe ex-

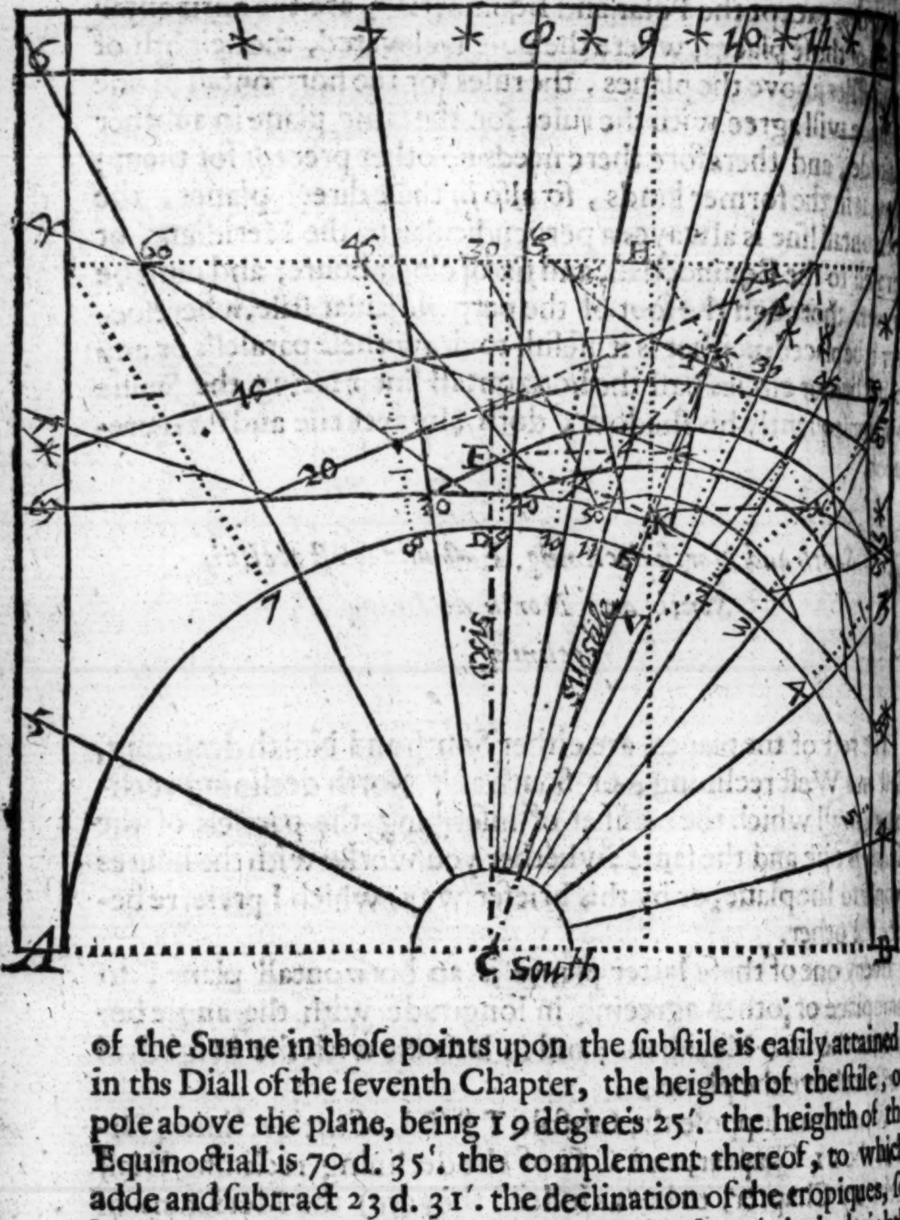
exactly hold without alteration at all : for ſeeing that all their paralels, except the Polar and Equinoctiall, are the horizontall lines of thoſe places, where the pole is elevated, the heighth of their ſtiles above the planes, the rules for the horizontall in one latitude will agree with the rules for the ſame plane in another latitude, and therefore there needs no other precept for them ; now as in the former kinds, ſo alſo in theſe direct planes, the horizontall line is alwayes a perpendicular to the Meridian, or paralell to the Equinoctiall, and ſix of clock houre, and muſt be drawne thorough the foot of the perpendicular ſtile, whereſoever it be placed; neither is it uſefull to draw theſe paralells or any other lines or circles paſt the horizontall line : ſeeing the Sunne and conſequently his ſhadow, doth alwayes riſe and ſet thereupon.

South and North declining. East and West reclining.
South and North declining reclining.

The reſt of the planes, are either South and North declining, East and Weſt reclining, or South and North declining reclining ; in all which the manner of inſcribing the paralels of the Sunne is one and the ſame ; whether you worke with the houres proper to the plane, or by this briefer way, which I preferre before the other.

Everyone of theſe latter planes is an horizontall plane, to ſome place or other agreeing in longitude with the angle betweene the two Meridians ; and in latitude with the heighth of the ſtile above the plane.

Wherefore ſuppoſe the ſubſtile T P T L of the declining Diall in the 11 Chapter, and C G of the declining reclining Diall in the 17 Chapter, to be (as indeed they are) the Meridians of the horizontals, in longitude and latitude proper to them ; upon which firſt of all pricke downe the place of the perpendicular ſtile, the two Tropiques, and Equinoctiall, which by the heighth



of the Sunne in those points upon the substile is easily attained; in ths Diall of the seventh Chapter, the heighth of the stile, or pole above the plane, being 19 degrees 25'. the heighth of the Equinoctiall is 70 d. 35'. the complement thereof, to which adde and subtract 23 d. 31'. the declination of the tropiques, so have you 94 d. 6'. whose complement 85 d. 54'. is the heighth of the Sunne in ♋, and 47 d. 4'. the heighth in ♑. Now because the Equinoctiall is alwayes a straight line, cutting the substile

[r]ight angles; first assigne the place thereof, where you [wi]ll, but so that it may crosse most of the houre lines, and stand [conv]enient for the plane, as it doth at G in the Diall aforesaid; [the]n the lenghth of C G in some knowne parts, suppose 2 17 that [is] two inches, and 17 hundred parts; by this line proportion the [sti]le, by *the first and second of R. P. Triangles*.

			Logar.
As the radius G F C	90 *d.*	0'.	+ 10000.00
Is to the line C G	217		+ 0336.46
So is the sine of { C G F And of G C F	70 / 19	35 / 25	+ 9974.57 / + 9521.71
To the axis of the stile C F	205		+ 10311.03
And to the radius of the Æquator G F	72		— 19858.17

Complement Characteristica o.

And againe, by the same Cases.

			Logar.
As the radius C K F	90 *d.*	0'.	+ 10000.00
Is to the line C F	205		+ 0311.03
So is the sine of K C F	19	25	+ 9521.71
To the length of the perpendicular stile K F *in parts of an inch.*	.68		— 19832.74

Charact. Complement o.

If you like to use the Sector or a line divided into 10 or 100 parts, instead of the scale of inches, you may find the same K F with more facility, by adding the naturall tangents of C K and K G, (the heighth of the pole above the plane, and complement thereof) together, or by taking the Arithmeticall complement of the Logarithme of those two tangents, 3162 &c. as is

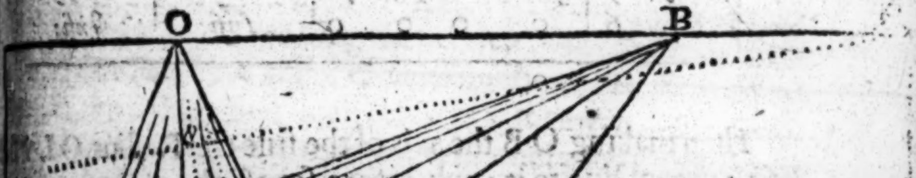
is directed in the horizontall, which giveth 316 parts of the Sector, equall to 68 parts of an inch, as abovesaid.

Having found the length of the stile K F, you may finde the place thereof of the tropiques and Equinoctiall upon the substile, in inches and parts, by resolving the triangles F C K, F G K, and F T K of the Diall &c. but I doe rather commend the use of the naturall tangents, as both the speedier, and the easier working, for making K F the radius, C K T shall be a tangent line to it: wherfore divide a line equal therto (as in the first Chap.) or open the Sector to the widest thereof, and from either take 2817, the naturall tangent of 70 d. 35′, and set it from C to K for the place of the stile, or 352 the naturall tangent of 19 d. 25′, from G to K the point formerly assigned for the Æquator; set 072 the naturall tangent of 4. d. 6′, the complement of the heighth of the Sun in ♋, from K towards the center, for the paralell of ♋: and set 93 the naturall tangent of 42 d. 56′, the complement of the heighth of the Sunne in ♑ from K to T, for the place of the Tropique of ♑, and thus you may proceed with all planes that cut the axis, both with the intermediate signes, and paralels of declination upon the substile. This done, let H O in the one example, and G F in the other, be radius: (which in all Dials is the secant of the heighth of the pole, or stile above the plane) unto which the Sector being opened (or from two lines divided equall to them, into ten parts) you may by helpe of the naturall tangents of 15 d. 30 d. 45 d. 60 d. and 75 d. pricke downe upon the Equinoctiall, on each side of the substile, obscure houre lines, as if you were to draw an ordinary horizontal Diall upon that plane: because the Equinoctiall line ♈ G ♎ is a tangent line to the Radius F G; the first paire of them shall be instead of 1 and 11, the second of 2 and 10, the third of 3 and 9, the fourth of 4 and 8, the fift of 5 and 7, as are the prickt lines marked with 7. 8. 9. 10 11. 12. 1. 2. 3. and 4. in the 11 and 17 Chapters aforesaid, the six of clock houre (if there be cause to use it) is alwayes paralell to the Equinoctial, neither are these lines to be blotted out againe (as in some cases the like be) but rather to be distinguished by small pricks (as in both the examples of the former Chapters

you

[illegible]done) seeing besides this use of inscribing the paralels, [illegible]lso serve to shew the true houres of that Country where [illegible]e is horizontall.

[illegible] done draw the trigon O ♑ ♋, as before directed in the [illegible]ap, and crosse it at right angles with O B, let O B be equall [illegible]is C F, and O A to G F, in the declining reclining Diall [illegible]17 Chapter. Next, out of the table following, under the [illegible]e 19 degrees 25'. (which is the heighth of the pole above [illegible]e) take the houre arches (corrected by proportion) and [illegible]t them with the naturall tangents and secants into a table, [illegible] is done.



Houres.		Angles at the Equator.		Angles at B.		Tangents.	Secants.
[illegible]	[illegible]	70	35	19	25	352	1060
[illegible]	[illegible]	69	57	[illegible]	3	365	1064
10	2	67	52	22	8	407	1079
9	3	63	30	26	30	498	[illegible]
8	4	54	49	35	11	705	1227
7	5	36	18	53	42	1361	1689
6	6.	0	0	0	0	Infi:	Infi:

Then making O B the axis of the stile the Radius, O L ♈ shall be a tangent line to it: wherefore set off the tangent of every houres arch, *viz.* 352, 365, 407, &c. from O downwards upon the line O ♈, and by the pricks 1.2.3.4. and 5. draw straight lines from B, which shall represent the prickt houre lines of the Diall crossing the paralels of the signes upon the Trigon, at the like distances from B, that the same paralels wil doe the said lines from the center of the Diall; having the angles at the Equinoctiall, and their complements at B ready given in this Table, you may by the very same rules of the Horizontall, find the distances of B D, B E, B F, B H, B K, and B ♋, upon that houre line of 4 and 8, and in like manner upon all the rest, for as the angles O B D, O E B, O F B, &c. are to the side O B in parts of a scale of inches (or as radius supposed to be divided into 1000 parts) so are the angles D O B, E O B, F O B, &c. unto the lines B D 936, B E 971, and B F 1070 and so of the rest; which taken of the Sector, or a line divided equall to O B, and set from the center C of the Diall upon the prickt lines of 8 and 4, give the distances of each paralell upon those houre lines; and so must you worke with the rest of the houre lines also.

De-

Decliner without a center.

Lastly, for the decliner of the eleventh Chapter, without a center, the rules are the very same with this former; but because the axis of the stile, which is there found to be 29 inches 79 hundred parts, is too long to put upon this Trigon, take the tenth part thereof, which is two inches 98 hundred parts, and set that distance from O to R, and making O R the Radius, divide a line equall thereto into ten parts: or open the Sector to that widest, and set of the naturall tangents of each houres arch in the table adjoyning, from O downwards upon the line O ♈, & thorough those pricks draw straight lines from R, representing the prickt houre lines of the Diall, crossing the paralels of the signes, as doth the prickt line R 8 for 8 and 4 of clock in the trigon. This done, proceed in the calculation in all respects as formerly, which being already sufficiently explaned, I will onely adde this example of calculating the two Tropiques together, as in the latter instance of the horizontall.

And note, that having found the distances from the center, you must seeke them also by the former rules of the horizontall from the Equinoctiall, as are H 12, æ 1, æ 2, æ 3, and æ 4, because the Diall hath no center to set them from.

Now you might by the same rules but (with much more labour) find out the paralels upon the houre lines themselves, of these last sorts of Dials: but I preferre this way. First, because you have two Dials contrived into one, not unpleasant to behold. Secondly, the whole worke is the same, in these severall sorts, without variety or change; and lastly, because the one halfe of the labour is saved, there being but sixe houres at the most to worke upon after this manner, which are 10. 11. & 12. in most sorts besides.

Houres.		Angles at the Equator. d	'	Angles at R. d	'	Tangents	Secants.
12	0	86	2	3	58	069	1002
11	1	85	54	4	6	072	1002
10	2	85	25	4	35	080	1003
9	3	84	24	5	36	098	1005
8	4	82	6	7	54	139	1009
½	½	79	44	10	16	181	1016

Declination of ♋ and ♑.	d	'	Arith. Complement.	Logarith.	Lines from the Center.	Lines from the Equator.		Hou
	23	31	9962.34					
Added to each hou. arch composeth these,	109	33	0025.78	9988.12	973	29		12
	109	25	0025.42	9987.76	972	30		1
	108	56	0024.15	9986.49	969	34		2
	107	55	0021.58	9983.92	964	41		3
	105	37	0016.33	9978.67	952	57		4
	103	15	0011.71	9974.05 ocõpl. char	942	74		4½
And subducted out of the same, leaveth these:	62	31	0052.00	10014.34	1034	32	H.12	12
	62	23	0052.52	10014.86	1035	33	2. 1	1
	61	54	0054.46	10016.80	1039	36	2. 2	2
	60	53	0058.66	10021.00	1050	45	2. 3	3
	58	35	0068.84	10031.18	1074	65	2. 4	4
	56	13	0080.31	10042.65	1104	88		4½

CHAP. XXVIII.

To describe the diurnall arches upon any Plane.

THe paralels of the signes, and the diurnall arches are one and the same circles in the *Sphere*, differing onely in the quantity of their declinations from the Equinoctiall in ♋ and ♑, they are coincident in ♉ & ♌, ♏ and ♒, they differ but very few minutes; wherefore if you would inscribe them on any of the dials before mentioned, let the middle and outward lines of the *Trigon* remayne, but the intermediate must be drawne (by helpe of the chord) on both sides of the Equinoctiall, at the distances of the declinations desired, the rest of the worke continuing the same as afore. So if you will put on the diurnall arch of 9 houres or 15: take of the chord the arch of declination 16 d. 55′. and for 11 and 13 houres, the declination of 5 d. 55′. answerable to the semidiurnall arches: and set them both wayes from L to b and d in the prickt circle LT of the former Diagram, and draw straight lines from O to b and d, and so of the rest, which you may find ready calculated in this Table; the Trigon being filled with diurnall arches, in stead of the signes, and the houre lines crossing them, as formerly they did the signes, afford you Triangles, which being resolved, according to the former rules, give the distances of the diurnall arches, either from the center, or from the Equinoctiall, as is most convenient for your worke.

To calculate this Table or the like, first convert the semidiurnall arches into degrees and minutes, allowing 15 d. for one houre: and 15′. for one minute of time, so shall 56 d. 47′. answere to 3 houres, 47′. and 60 d. to 4 houres, and so of the rest; Then *by the first of the fift case of R. S. triangles.*

Houres

A Table of Semidiurnall arches.

Houres & parts.		Degrees and minutes.		Their declinations		Signes.			Signes.		
d	′	d	′	d	′		d	′		d	′
3	47	56	47	23	31	♑	0	0	♑	0	0
4	0	60	0	21	40	♑	22	17	♐	7	43
4	30	67	30	16	55	♒	13	11	♏	16	49
5	0	75	0	11	37	♒	29	42	♏	0	18
5	30	82	30	5	55	♓	15	2	♎	14	58
6	0	90	0	0	0	♈	0	0	♎	0	0
6	30	97	30	5	55	♈	14	58	♍	15	2
7	0	105	0	11	37	♉	0	18	♌	29	42
7	30	112	30	16	55	♉	16	49	♌	13	11
8	0	120	0	21	40	♊	7	43	♋	22	17
8	13	123	13	23	31	♋	0	0		0	0

			Logar.
As the whole sine	90 d.	0′.	10000,00
Is to the cotangent of the latitude	51	32	9900,09
So is the Cosine of any semidiurnall arch, as for 4 houres 30′ is	67	30	9582,84
To the tangent of the declination	16	55	19482,93

For the place of the Sunne answerable thereto, *by the first of the eighth Case of R. S. triangles.*

As

			Logar.
the sine of the greatest declination	23 d.	31'.	9600.99
the whole sine	90	0	10000.00
the sine of the particular declination	16	55	9463.83
the distance of the Sunne from ♈ or ♎ the Semidiurnall arch directeth	46	49	9862.87

Therefore 16 d. 55'. declination is answerable to 16 d. 49'. ...in, or to 13 d. 11'. of ♌ and ♒, which are in paralel- ...with them.

CHAP. XXIX.

How to draw the Iewish houres, commonly called the old unequall houres upon any Plane.

THe Iewes divided their artificiall day and night, whether longer or shorter, alwayes into 12 houres, and began their account at Sun-rise for the day, and at Sun-set for the night, as wee doe at noone and midnight; so that Sun-rise was their first houre, twelve of clocke their sixt houre, and Sun-set their 12 houre; according to which their Dials were made, and houre lines projected, upon all sorts of planes: but in this they differ from the Planitary houres, that the one respecteth the divisions of the Equinoctiall, as the other doth of the Ecliptique. These houre lines are easily contrived upon any kind of plane in the latitude of 51 d. 32'. after this manner. The ordinary houres and quarters being first drawne, together with the paralels of the signes, or diurnall arches, make choice of any two signes or diurnall arches, equidistant

ſtant from the Equinoctiall, or not, as is fitteſt for the plane, ſup-
poſe ♋ and ♑, *by the ſecond of the fourth caſe of R. S. triangles*,
find the ſemidiurnall arches in degrees and minutes. For

			Loga.
As the cotangent of the latitude	51 *d.*	32′.	990[illegible]
Is to the tangent of the greateſt declination	23	31	963[illegible]
So is the Radius	90	0	10000[illegible]
To the coſine of the ſemidiurnall arch of ♑ *and ſeminocturnall of* ♋	56	47	973[illegible]

Therefore the ſemidiurnall arch for ♑, is 56 d. 47′. and the
complement thereof to 180 d. *viz.* 123 d. 13′. is the ſemidiur-
nall arch for ♋; double theſe arches, and divide each of them by
12, ſo ſhall you have 20 d. 32′. for one twelfth part in ♋, and
9 d. 28′. for one twelfth part in ♑, and ſo by addition proceed
to ſix twelve parts, convert theſe degrees and minutes into time,
allowing 15 d. to one houre, and foure minutes to one degree,
and marke their diſtances upon both Tropiques, each way from
the houre of 12 (in which both kind of houres concurre to be
the ſame line) ſo ſhall you have 3 pricks, *viz.* two in the Tro-
piques, and one in the Equinoctiall (every unequall houre croſ-
ſing one of the ordinary houres in the Æquator) by which to
draw each houre line, as in this Table appeareth, wherein the
fift and ſeventh unequall houres are diſtant from 12. in the pa-
ralell of ♋ 1 houre, 22′. but in ♑ 0 houre 38′. and muſt paſſe
thorough 11, and 1 of clock in the Equinoctiall; the fourth and
eight houres are diſtant from 12. two houres 44′. in ♋, and 1
houre 16′. in ♑ and paſſe thorough 10 and 2 of clocke in the
Equinoctiall, and ſo of the reſt.

But if inſtead of the ſignes, the diurnall arches be inſcribed in
your Diall, you may much more eaſily and preciſely worke by
them, eſpecially if your plane will receive the ninth and 15 pa-
ralels; becauſe the diſtances of every twelfth part of them from
the Meridian, will juſtly fall upon the houres, halfes, and quar-
ters formerly drawne; firſt therefore reduce theſe paralels into
de-

…une-…all houres …12.	The paralels of ♑ in D	M	H	M	The Equi-noctiall. H	H	The paralel of ♋ in D	M	H	M
H										
7	20	32	1	22	11	1	9	28	0	38
8	41	4	2	44	10	2	18	56	1	16
9	61	36	4	6	9	3	28	24	1	54
10	82	9	5	29	8	4	37	51	2	31
11	102	41	6	51	7	5	47	19	3	19
12	123	13	8	13	6		56	47	3	47

grees and minutes, allowing as afore, ſo ſhall the paralell of 9 houres containe 135 d. and of 15 houres 22 d. divide each number by 12. the quotient will be 18 d. 45'. for one 12 part in the paralell of 15 houres, and 11 d. 15'. for one 12 part in the paralell of 9 houres, and 37 d. 30'. for two 12 parts in the paralell of 15 houres, and 22 d. 30'. for the like two 12 parts in the paralell of 9 houres, and ſo of the reſt; convert theſe degrees and minutes into time (allowing as aforeſaid) and each 12 part of theſe paralels will fall out upon the houres, halfes, and quarters, and therefore their diſtances from 12 the more eaſily and exactly marked upon each paralell, which done, you have 3 pricks (as afore) *viz.* two in the paralels of 9 and 15. and one in the Equinoctiall, by which to draw every unequall houre, as in this Table appeareth, wherein the fift and ſeventh unequall houres are, diſtant from 12 in the 15 paralel 1 houre 15'. in the 9. o. ho. 45'. and muſt paſſe thorough 11 and 1 of clocke in the Equinoctiall; the fourth and eighth houres are diſtant from 12 in the 15 paralell two houres 30', in the ninth 1 houre 30'. and paſſe thorough 10, and two of clocke in the Equinoctiall, and ſo of the reſt, and note that theſe Tables thus prepared, ſerve generally for all planes in this latitude.

The

The unequall houres from 12.		The paralels of 15 Houres in				The Equinoctiall.		The paralels of Houres in			
H	H	D	M	H	M	H	H	D	M	H	M
5	7	18	45	1	15	11	1	11	15	0	
4	8	37	30	2	30	10	2	22	30	1	
3	9	56	15	3	45	9	3	33	45	2	
2	10	75	0	5	01	8	4	45	0	3	
1	11	93	45	6	15	7	5	56	15	3	45
12		112	30	7	30	6		67	30	4	30

CHAP. XXX.

How to describe the Azimuthes and Almicanters upon each Plane.

THere are also three various inscriptions of the Azimuthes and Almicanters, as there were of the signes and diurnall arches; according as the Planes whereon they are described, doe cut the axis of the Horizon, rightly, obliquely, or are paralel thereto; the polar plane is to the pole of the World, the houre circles and the paralels of declination, in all respects, as the Horizontall is to the Zenith, the verticall circles, and the paralels of the Horizon; wherefore as in the first sort the plane cutteth the axis of the World, at right angles, and the houre lines doe meet at equall angles in the center, representing the pole, and the paralels of declination doe crosse them with perfect circles; so in the latter sort the plane doth cut the axis of the Horizon at right angles, and the Azimuths doe meet in the place of the perpendicular stile, representing the Zenith or pole of the Horizon at equall angles; and the Almicanters are perfect circles

circles crossing the same; whatsoever therefore is said of the one, may be understood of the other, neither needs there any further directions for the same; yet for more plaines, I will adde this example. Let F E in the Scheme adioyning represent the Meridian line, passing by G the foot of the stile in the Horizontall Diall; G in the Diall, and F in this Diagram shall be the Zenith, or center of all the azimuths; upon which describe the obscure arch E B, equall to A B 60 d. of the chorde, and by helpe of the same chorde, pricke downe thereupon the arches of 10 d. 20 d. 30 d. 40 d. 50 d. &c. or what other you thinke fit: straight lines drawne from G in the Diall, as here they are from F, thorough the pricks aforesaid, are the true azimuthes desired; Let F B be drawne perpendicular to F E, and therein make F H equall to G D the perpendicular stile of the Diall, and draw H 1, paralell to F E, the lines H 6. H 5. H 4. H 3. H 2. and H 1. be the semidiameters of the Circles, describing the almicanters upon the circle G of the horizontall: whose lengths are thus easily found, if you will worke by a scale of inches. For

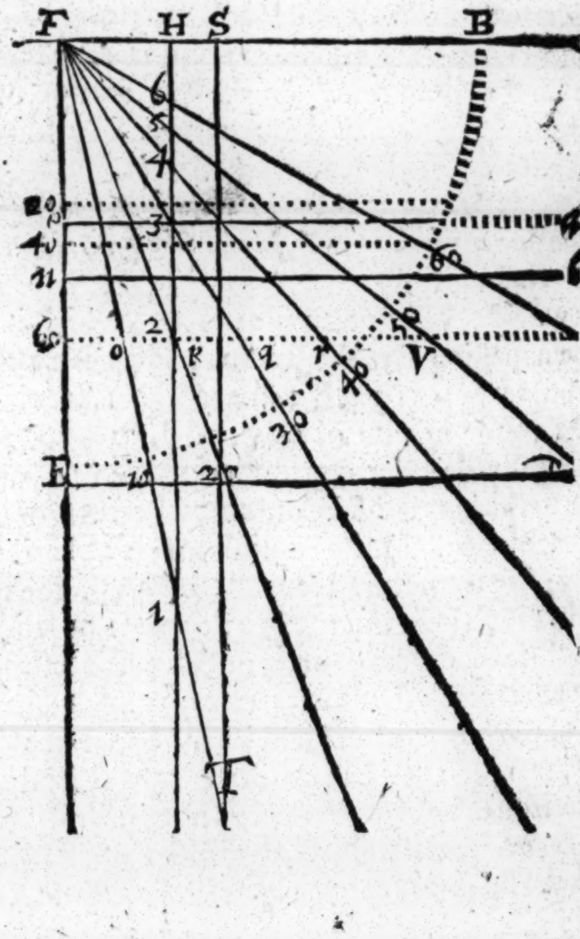
As F 6 H *the sine of* 60 *d. is to* F H *in hundred parts of an inch;*
So is H F 6. *the sine of* 30 *d. to* H 6, *in the like parts, by the second case of R.P. Triangles.*

But if you will worke by naturall tangents, which is farre the easier way, then making F H the Radius, H 31 is a tangent line to it, and the lines h 6. h 5. h 4. h 3. h 2. and h 1. are the naturall tangents of the complements of 60 d. 50 d. 40 d. 30. 20 d. and 10 d. wherefore divide a line equall thereto into 10 parts, or open the sector to the length of F H, and take thereof 577, the naturall tangent of 30 d. for the Semidiameter of H 6. the almicanter of 60 d; 839 the naturall tangent of 40 d. for the semidiameter of H 5. the almicanter of 50 d. and 1 192 the naturall tangent of 50 d. for the semidiameter of H 4, the almicanter of 40 d. and so of the rest; All which circles, being described upon the center G of the horizontall Diall, as they are marked with 60, 50, 40 &c. thereon: you have the circles of altitude, or parallells of the Horizon desired; which need not be drawne past the tropiques of ♋ and ♑ in the Diall, because the apex of the stile which giveth the shadow, cannot exceed those limits.

CHAP. XXXI.

The second sort.

ALL upright planes are paralell to the axis of the Horizon, as all the Equinoctiall planes are to the axis of the World; and therefore the Azimuths in those, as the houre lines in these, are paralell one to another; such are the South and North direct, the East and West direct, and all South and North declining planes; wherefore let F E of the Diagram



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djoyning represent the horizontall line of the South Diall, Chapter seventh, drawne thorough the foot of the stile G, parallel to the 6 of clock houre; and let F B crosse it at right angles, upon the center F; describe an obscure arch of a quadrant E B, equall to A B of the chord; and therein inscribe by helpe of the chord, the Almicanters of 10 d. 20 d. 30 d &c as formerly you did make F S, equall to G D, the perpendicular stile of the Diall; and draw S T paralel to F E: These things prepared, you may first inscribe the Azimuthes on the Diall, and then transferre them to this Diagram, for finding the Almicanters in this manner; Let G D the perpendicular stile in the South Diall, equall to G X, be supposed to be perpendicular to the horizontall line thereof; and making G X the Radius, the horizontall line 7 G 5 shall be a tangent line thereto, and the naturall tangents of 10 d. 20 d. 30 d. 40 d. &c. prickt downe from G upon the horizontall line both wayes, *viz.* 364 for 20, and 839 for 40 d., &c. as in the Table adjoyning: and by those pricks parallels drawne to the 12 of clock houre in the Diall (as are 20.40.60 and 70) shall give the true Azimuths desired; you may likewise, knowing the length of G X, or G D in parts of an inch, and the angles of the Azimuths at X with their complements upon the horizontall line of the Diall, find the same distances in the like parts, for as

Azimuths.	*Tangents.*	*Secants.*
d		
10	176	1015
20	364	1064
30	577	1155
40	839	1305
50	1192	1556
60	1732	2000
70	2747	2924
80	5671	5759

the angle G L X of the 60 Azimuth, is to the line GX in parts, so is the angle G X L, the complement of the former, to the line G L in like parts, *by the 2. Case of R. P. Triangles*, and so of the rest; but to worke by naturall tangents, is the speedier way; The Azimuth being thus drawne, you may transferre them into this Diagram, either by taking the distance of each Azimuth upon the horizontall line from X as X L for 60 d. for 40 d. X N &c. & setting from F downwards upon the line F E to F 20, F h, F 40. F n, F 60, and F E &c. or else making F S equall to G X the Radius, open the sector to that widest, and set 1155 the secant of 30 d. from F to H, and 1732 the secant of 60 d. equall to X L, from F to 60 d. and 2924 the secant of 70 d. from F to E, and so of the rest, as in the table adjoyning, to which points raise perpendiculars, as are h a, n b, and E d, and they shall represent the azimuthes in the Diall, crossing the Almicanters of 10 d. 20 d. 30 d. 40 d. 50 d. &c. at the same distances from the line F E in the Diagram, that they will doe from the horizontall line of the Diall upon the azimuth answerable to them; and may easily be inscribed by naturall tangents, seeing the azimuths in the Diall are tangent lines to the severall secants X L and X N, &c. as the lines d e, v 60, a h &c. in the Diagram representing the azimuthes are unto each Radius F h, F 60, F E, &c. representing the secants; thus you may find that F 60 equall to X L, being Radius, 60, o will be 176 the naturall tangent of 10 d. and 60. and will be 364 the naturall tangent of 20 d. and 60 q, 577 the naturall tangent 30 degrees and 60 r. 839 the naturall tangent of 40 d. and so of the rest; all which being taken of the Sector, and set downwards from L, the intersection of the 60 azimuth with the horizontall line of the Diall, shall give pricks upon that azimuth at 1. 2. 3. 4. 5. by which the severall almicanters must passe: doe the like with as many of the rest of the azimuths, as will serve your turn, (for upon all you need not) as upon the 20 and 40 azimuth, and upon e d for the 70 azimuth, so shall you have severall points in severall azimuths, thorough which one continued circular line being drawne, you have the almicanters desired; If instead of these tangents, you will use a scale of inches, first find the length of F

60, in parts of an inch : then is the proportion plane, for *by the second Case of right angled plane triangles, as* F 60 *the radius, is to* F 60 *in knowne parts, so is* 60.0. *and* 60 p. *and* 60 q. *&c. the naturall tangents of* 10 *d.* 20 *d.* 30 *d. to the lines* 60.0. 60 p. *and* 60 q. *in like parts as afore.*

East and West direct.

In like manner, if instead of F S in the Diagram, equall to the perpendicular stile of the South Diall, you take the length of A 3, or A 9 equall to A L the length of the stile of the East and West Diall in the ninth Chapter, and worke in all respects therewith (first drawing the Horizontall line B A C thorough the foot of the stile at A, and supposing A P equall to A L, to be perpendicular thereto) the same naturall tangents of 10 d. 20 d. 30 d 40 d. &c. (taken of a line divided equall to A P, or the Sector opened to the widest thereof) and set both wayes from A upon the horizontall line B A C, shall give you points therein, to which perpendiculars erected, you have the azimuths desired; as are 20. 40. 60. 70. &c. in the Diall of the ninth Chapter aforesaid. The azimuths being drawne, let the secant of each azimuth 20. 40. 60. 70 &c. (which is the distance from P the top of the stile, unto the intersections with the horizontall line) be a severall Radius, and the naturall tangents of 10 d. 20 d. 30 d. 40 d. &c. set from the horizontall line downwards upon each correspondent azimuth, shall give points, by which circular lines being drawne, you have the almicanters desired; so making A P the stile in the East Diall, equall to A L the Radius, the naturall tangent of 60 d. 1732 set from A to 60 gives the distance of the azimuth of 60 in the horizontall line, and making P 60 the secant of 60 d. 2000 the Radius, the naturall tangent of 10 d. 176. and the naturall tangent of 20 d. 364 and the naturall tangent of 30 d. 577 with the rest, set from 60 downwards upon that azimuth, shal give points therein, by which the almicanters must be drawne, as are marked with 1.2.3.4. and 5.

South and North declining.

Laſtly, in the declining Diall of the 11 Chapter, let PO the length of the ſtile be perpendicular to the horizontall line VPR, which being Radius, the Azimuthes ſhall be tangents thereto, the firſt whereof (reckoning from the Eaſt as (*Clavius* doth) muſt alwayes be perpendicular to the interſection of the Horizon, Æquator, and ſix of clock houre, as is 6 Z in the Diall aforeſaid, diſtant from the foot of the ſtile P, the complement of the declination, and in this example is 112 the naturall tangent of 6 d. 23′. which being added to 10 d. 20 d. &c. for the azimuthes to the Northward of 6, or ſubducted from 10 d. 20 d. 30 d. 40 d. 50 d. &c. for the azimuthes to the Southward, ſhall give arches, whoſe naturall tangents ſet both wayes from P, afford you pricks in the horizontall line for the azimuthes deſired; Thus I take 294 the naturall tangent of 16 d. 23′, and ſet it from P to 10, for the tenth azimuth: and 496 the naturall tangent of 26 d. 23′. and ſet it from P to 20 for the 20 azimuth to the Northwards; and 437 the naturall tangent of 23 d. 37′. for 30 d. and 2016 the naturall tangent of 63 d. 37′ for 70 d. and ſet them from P to the Southwards, to all which draw perpendiculars (as in the example appeareth) ſo have you the azimuthes deſired. Now, making the ſecants of each of theſe azimuthes a ſeverall Radius, *viz.* o. 30 d. 1097 the ſecant of 23 d. 37′. for the azimuth of 30 d. and o. 70 d. 2250 the ſecant of 63 d. 37′. for the azimuth of 70 d. and opening the Sector to theſe wideſts, take of the naturall tangents of 10 d. 20 d. 30 d. 40 d. &c. as in the former table, and ſet them downwards from the horizontall line upon each azimuth, ſo have you pricks, by which the Almicanters continued into one circuler line of the ſame denomination, muſt certainly paſſe, as you ſee the circuler lines of 10 d. 20 d. 30 d. 40 d. and 50 d. doe in the example of the Chapter aforeſaid.

CHAP.

CHAP. XXXII.

Their third sort.

NOw in al the rest, that is in South & North reclining; East and West reclining; and South and North declining reclining; the planes cut the axis of the Horizon obliquely, and therefore the Azimuths (as in the like cases the houre lines did) doe meet in a center with unequall angles. In these planes there are two zeniths, the one proper to the plane, alwayes in the foot of the perpendicular stile, the other peculiar to the place, alwayes in the Meridian or 12 of clock houre line, but more or lesse differing from the former, according to the nature and site of the plane; and as the zenith, so doe the horizontall lines also differ, both which must be first found before you can inscribe the Azimuthes and Almicanters.

Equinoctiall and Polar Plane.

Make the perpendicular stile the Radius in all these kinds, then shall you have three varieties of finding these points, first in the Equinoctiall plane of the 13 Chapter, wherein the verticall point of the place is distant from the foot of the stile (being the verticall of the plane) the naturall tangent of the elevation of the pole, which is the inclination of that plane to the Horizon, and the point by which the Horizontall line must passe, is the naturall tangent of the Complement of the pole, which is the reclination of the plane from the Zenith. But in the polar plane this is quite contrary, so is A 3 the Radius in the Diall of the 13 Chapter, and B A 12 a tangent line to it, and C D equall to B C in the diall of the 14 Chapter, H V A a tangent line to it, and A V the naturall tangent of 51 d. 32′. gives the verticall point in

the

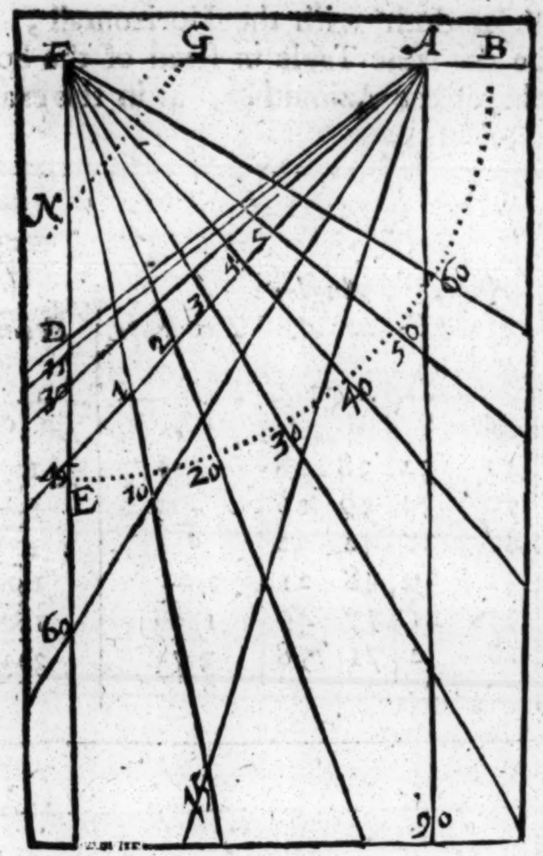
Equinoctiall; but C H the same tangent gives the horizontall point in the polar; In like manner A H the naturall tangent of 38 d. 28′. gives the horizontall point in the æquinoctiall plane; and C V the same tangent, the verticall point in the polar; thorough H draw a paralell to 7 A 5 in the Equinoctiall, and to 6 C 6 in the polar plane, and that shal be the horizontall line in each; This done make H 3. 1277 the secant of 38 d. 28′. the Radius for the Equinoctiall Diall, and H D 1607 the secant of 51 d. 32′. the Radius for the Polar, then shall the azimuths upon each horizontall line be the naturall tangents of 15 degrees, 30 degrees, 45 degreees, 60 degrees, and 75 degrees (or of any other parts you thinke fit) which being taken of a line divided into ten parts, or of the Sector opened to the length of either Radius, pricke downe both wayes from H in each Horizontall line, and straight lines drawne from each verticall point at N thorough the prickes aforesaid, as are V. 15. V. 30. V. 45. &c. in the Dials of 13 and 14 Chapters, you have the azimuthes required.

Now make the Diagram adjoyning, wherein let F E be the horizontal line E B the arch of a Quadrant, the lines 10 degrees, 20 degrees, 30 degrees, 40 degrees, &c. the same as afore, and F B crossing F E at right angles as formerly, and further let F A equall to V 3 (of the Diall of the 13 Chapter) and F G equall to V D (in the Diall of the 14 Chapter) representing the axis of the Horizon, be the secant of 51 degrees, 32′. 1607, and F D, F N equall to 3 H, and D H, bee the Secant of the Complement thereof 1277; draw the line A D for the South verticall of this Diall, and G N for the polar, then making for the Polar, and F A the Radius for the Equinoctiall Diall, F D 60 shall bee a tangent line to it; and F D, F 15 degrees, F 45 degrees, and F 60 degrees, &c. shall bee the naturall tangents of the Angles F A D, F A 15 degrees, F A 30 degrees, which are againe (as formerly in the Houre lines) the Complements of the arches of the Table following, under the heighth of the Pole 38 degrees 28′. directly agreeing with the Table of houre lines for the South and North Dials

als; as the Polar doth with the Horizontall; wherefore heere transcribe the same Table in stead of the houre lines, taking the Arches of the Azimuthes, as in this example.

Azimuthes.		*Angles at the Equator.*		*Angles at A.*		*Tangents.*	*Secants.*
d	′	d	′	d	′		
0	0	51	32	38	28	794	1277
15	0	50	34	39	26	822	1295
30	0	47	28	42	32	917	1357
45	0	41	39	48	21	1124	1505
60	0	32	11	57	49	1589	1877
75	0	18	2	71	58	3072	3227

The angle FAD being 38 degrees 28′. take the naturall tangent thereof, 794 (of the line divided, or of the Sector) and set it from F to D. The angle F A 30 being 42 degrees 32′. set the naturall tangent thereof 917 from F to 30. The angle FA60 being 57 degrees 49′. set the naturall tangent thereof 1589 from F to 60; and so of the rest, straight lines drawne from A thorough these points, shall be the azimuthes crossing the Almicanters of 10. 20. 30. 40. &c. at the same distances from A in this Diagram, that they shall doe from V the verticall point of the Diall, and are easily found by the former rules, because you have the three angles of every Triangle F 5 A, F 4 A, F 3 A, &c. given, *viz.* at A the Complement of the Arch in the Table, at F the Complement of



of the Almicanter, and at 5 the Complement of both to 180d. with the side F A, the axis of the Horizon supposed to be the Radius divided into 10. 100. or 1000 parts, as you thinke fit, wherefore *by the first case of O.P. triangles.*

As the sine of the angle F 5 A 91 *d.* 39′. *is to the line* F A 1000
So is the sine of the angle A F 5 40 *d.* 0′. *to the line* A 5 643

and so of the rest: you may likewise calculate each paire of Almicanters æquidistant from the horizontall line (if it were needfull) at one worke, as you did the paralels of the signes, or all of them together upon each severall Azimuth, by the former rules, as in this example is done for the 45 Azimuth.

The

The angle in the table for 45 d. is	41 *d.* 39′.		*Cosines.*
The Almicanters with the Cosines set by them.	10	0	9993.55
	20	0	9972.98
	30	0	9937.53
	40	0	9884.25
	50	0	9808.07
The Almicanters added to the angle 41 d. 39′. with the Arithmeticall complement of each arch to avoid subtraction	51	39	0105.55
	61	39	0055.48
	71	39	0022.66
	81	39	0004.17
	91	39	0000.17

Logar. of Chil:	*The Almicanters from* A *or* V.	
+10099.10	1256	10 *d.*
+10028.46	1068	20
—9960.19	912	30
—9888.87	774	40
—9808.24	641	50
0. *compl char.*		

Now adde the Cosines of 10 d. 20 d. 30 d. &c. to the Arithmeticall Complement of 51 d. 39′. &c. and 61 d. 39′. &c. so have you new Logarithmes, which found in the *Chiliads*, give the lengths of the lines desired, wherefore of a line divided into 10 or 100 parts equal to FA, or of the Sector opened to that widest, take the lines 1256 and 1068 and 912 &c. which set from the verticall point V in the Diall of the 13 Chapter, shall give you points in the Azimuth of 45 d. by which the Almicanters of 10 d. 20 d. 30 d. &c. must passe, doe the like with as many other Azimuths as will serve your turne, at last draw all the points of the same denomination into one continued circular line, so shall you have the Almicanters desired. And here againe note for a generall rule, that in this and all the like cases, if any line fall out to be too long, to be set from the Zenith V, you may take that line out of the secant of the angle at A in the table above said. which

which gives the whole line from the verticall point to the Horizontall line, and set the remainder backe againe upon the Azimuth from the Horizontall line to the Almicanter; so if you set 912 from V to the 30 Almicanter upon the 45 Azimuth: or set the remaynder thereof subducted out of 1505 the secant of 45 d. back from 45 d. in the horizontall line, it will give the same point at a as afore, and so of the rest. Now making F G the radius for the Polar Diall, and using the table proper to the Horizontall, the rest of the worke will differ nothing at all from this.

South and North reclining.

Lastly, in the South and North reclining, the perpendicular stile being Radius, the Meridian is a tangent line thereunto, and the verticall point is the naturall tangent of 65 d. the inclination of the plane to the Horizon, as in the second example of the 13 Chapter, and the Horizontall point is the naturall tangent of 25 d. the reclination thereof from the Zenith, the complement of the former, both which being prickt downe in the Meridian from the foot of the stile, and the Horizontall line drawne perpendicular thereto, proceed in all respects as formerly.

East and West reclining, South and North declining reclining.

But in the East and West reclining, and South and North declining reclining planes, where the substile, which is the Meridian of the plane, and the 12 of clocke houre, which is the Meridian of the place, are severall lines, you must first draw a perpendicular to the base of the plane thorough the foot of the stile, as is V L H in the Diall of the 12 Chapter, and V K H in the Diall of the 17 Chapter: then making the perpendicular stile L N equall to L S in the one, and K N equall to K F in the other, the radius V L H, and V K H shall be tangent lines to them, and the verticall point V shall be the naturall tangent of 55 d. in the first, and 35 d. in the second, the inclination of each plane to the Ho-

Horizon, and the Horizontall point H ſhall be the naturall tangent of 35 d. in the firſt, and of 55 d. in the ſecond, the reclination of each from the Zenith, which is the complement of the former; the verticall point V in each muſt of neceſſity fall upon the 12 of clocke houre, which is the Meridian of the place, and the Horizontall line drawne by the point H muſt be perpendicular to the lines V L H, and V K H, drawne by the two Zeniths, and paſſe thorough the interſection of the Æquator, and 6 of clock houre, if there be no errour in the worke. Theſe things being found, you muſt proceed in all reſpects as in the former kinds; yet for further ſatisfaction I will give a more particular inſtance in the declining reclining Diall of the 17 Chapter. Next therefore let N H, the ſecant of 55 d. 1743 the reclination of the plane, be radius, then ſhal the Horizontal line H 60 be a tangent line thereunto; open the Sector to the wideſt of N H (or divide a line equall thereto) and from either prick downe the naturall tangents of 15 d. 30 d. 45 d. &c. both wayes from H upon the horizontall line, to each of theſe points draw ſtraight lines from V the verticall point, and theſe ſhall be the Azimuthes deſired, the 30 whereof to the Southwards from H ſhall be coincident with the Meridian or 12 of clocke houre, becauſe the plane doth decline ſo much: and though it had falne out in ſome unequall part of the quadrant (as for the moſt part it doth) yet had the worke beene one and the ſame: Now as in deſcribing the paralels of ſignes you tooke the Subſtile or Meridian of the plane for 12 of clocke, and drew the Horizontall houre lines on each ſide thereof, to facilitate the worke: ſo muſt you alwayes for the Almicanters take the Azimuth perpendicular to the plane (equall to the declination) as in the example is V K H: and on both ſides thereof inſcribe the Azimuths of 15 d. 30 d. 45 d. &c. by which meanes you may make uſe of the ſame table for finding the angles of the Azimuthes at the verticall point, and putting them into the Diagram, as formerly you did the houre lines; for let F A in the Diagram adjoyning, the axis of the Horizon, bee equall to V N in the Diall, which is the ſecant of 35 degrees inclination of the plane to the Horizon, and F B equall to N H, the ſecant of 55 degrees the reclination from the

the Zenith, and complement to the former; draw the line A B which shall represent the Azimuth V K H perpendicular to the plane, then if you make F A equall to V N the axis of the Horizon, the Radius, F 60 shall bee a tangent line thereunto, and F B, F 15. F 30. F 45. and F 60 &c. shall be the naturall tangents of the Complements of the arches proper to the Azimuthes, under the altitude of the Pole 55 d. equall to the reclination of the plane, which you may collect into a table for further use, as in this example appeareth.

Wherefore divide a line into 10 parts equall to F A, or open the Sector to the length of F A, and pricke downe the severall tangents of this table from F downwards upon the Horizontall line F B 60: by which draw streight lines from A, so shall you have the azimuthes of 15 d. 30 d. 45 d. 60. d. &c. crossing the Almicanters of 10 d. 20 d. 30 d. 40 d, &c. in this Scheme, at the same

Azimuths.		*Angles at the Horizon.*		*Angle at A*		*Tangents.*	*Secants.*
d	'	d	'	d	'		1743
0	0	35	0	55	6	1428	1785
15	0	34	4	55	56	1479	1928
30	0	31	14	58	46	1649	2254
45	0	26	20	63	40	2020	3025
60	0	19	18	70	42	2855	5611
75	0	10	16	74	49	5511	

ſame diſtances from A, that they will doe from V the verticall point of the Diall. Now have you new triangles here framed as in the former, *viz.* F 5 A, F 4 A, F 3 A, &c. whoſe angles being given with the ſide F A, either in knowne parts of an inch, or as Radius, the ſides A 5. A 4. A 3. &c. are eaſily found *by the firſt Caſe of O. P. Triangles.* whoſe diſtances prickt downe from V the verticall point of the Diall upon the azimuthall lines proper to them, doe give points for the almicanters deſired; ſo ſhall you find the diſtances of A 5, A 4, A 3, A 2, and A 1, upon the 45 azimuth to be as in this example,

The angle in the table under the latitude 55 d. for the Azimuth of 45 d. is	26 *d.*	20'.	*Coſines.*
The Almicanters with their Coſines	10	0	9993.35
	20	0	9972.98
	30	0	9937.53
	40	0	9884.25
	50	0	9808.07
The Almicanters added to the angle 26 d. 20'. with the Arith. Complement of each arch to avoid Subtraction.	36	20	0227.32
	46	20	0140.64
	56	20	0079.73
	66	20	0038.14
	76	20	0012.47

Logar.

Logar. of Chil:	*Almicanters from* A *or* V.		
+ ~~1~~0220.67	1 662	A 1	10 d.
+ ~~1~~0113.62	1 299	A 2	20
+ ~~1~~0017.26	1 041	A 3	30
—9922.39	836	A 4	40
—9820.54	661	A 5	50
o.*comp.char.*			

Adde the Coſine of 10 degrees to the Arithmeticall Complement of 36 d. 20′. and of 20 d. to that of 46 d. 20′, and ſo of the reſt, ſeeke the new Logarithmes of 0220. 67. &c. in the *Chiliads*, changing the characteriske of 1 into 3 or 4, for more exactneſſe ſake, ſo ſhall you find the diſtance of A 1 to be 1 662 that is one Radius, and 662 thouſand parts of another, which taken of a line divided as aforeſaid, or Sector opened to the wideſt of P A, and ſet from the verticall point V of the Diall, ſhall reach to the almicanter of 10 upon the azimuth 45 d. and ſo of the reſt: and note that if there be cauſe, you may by an arch of a circle draw the ſame azimuthes in the Diagram on the other ſide of A 90 alſo. Laſtly, the worke being finiſhed, you may diſtinguiſh the azimuths by what numbers you thinke fitteſt, beginning the accompt either from the 1 verticall as *Clavius* doth, and then the azimuth V K H perpendicular to the plane, ſhall be the 60. or from the Meridian, and then it ſhall be the 30, or from it ſelfe (as in this example is done for imitation ſake) and then the Eaſt azimuth ſhall be the 60, and the South verticall the 30 from thence, as much as the plane it ſelfe declineth.

CHAP.

CHAP. XXXIII.

How to describe the circles of position upon these Planes.

THe circles of position are great circles of the Sphere, crossing each other in the common intersection of the Meridian and Horizon, and reckoned (according to most authentike authors) upon the Equinoctiall, both wayes from the Meridian downe to the Horizon; the use of them (perticularly of those of 30 d. and 60 d. distant each wayes from the Meridian) is chiefly for such as are astrologically given, to shew them at all times of the day, in which of the 12 parts (commonly called the *houses of Heaven*) the Sun is commorant, but they doe also represent (considered upon the first verticall) the planes of every East and West reclining or inclining Diall, as hath beene said in the 12 Chapter aforesaid, whereof divers other uses might be made.

By the definition it appeares, that they are great circles, and therefore become straight lines, being projected upon the plane, and they are sometimes paralels, sometimes they meet at equall, and sometimes at unequall angles, according as the planes on which they are projected, are paralell, right, or oblique, to the axis of the prime verticall, in whose Pole they are omitted.

Horizontall, East and West direct, and East and West reclining.

In the horizontall, the East and West direct, and East and West reclining, these circles are all paralels; the reason is manifest, for as the houre lines of all such planes, as lie in any houre circle, are therefore paralels each to other, because the planes themselves cut not the axis of the World, but are paralell thereto; so is it in the *Circles* of *Position*, so oft as

Y their

their planes have the same situation to the axis of the prime vertical, in whose Poles they meet.

In a right sphere, the Equinoctiall plane lyeth in the houre circle of 6, and in the Horizon, paralell to the axis of the world, so doth the 90 circle of position (which according to Astrologers is the first and seventh house of heaven) in an oblique sphere, lie in the Horizon, paralell to the axis of the prime verticall.

In East and West Dials, the plane lyeth in the Meridian or houre circle of 12, which is also the first circle of position, prescribing the tenth and fourth house of heaven. In declining reckning to the pole the plane may happen upon any other houre circle or part, and so in East and West reclining, the plane may fall upon any other circle of position, from which agreement it is evident, that as the houre lines in the first sort, so the circles of position in the second, are evermore paralels each to other.

In the horizontall, they are thus easily inscribed: make FD of the Diall fol. 91. 1607 the secant of 51 d. 32', the elevation of the pole, the radius, then is ♈ F ♎ the Æquator a tangent line thereunto, and the naturall tangents of 577 for 30 d. and 1732 for 60 d. set each way upon the Equinoctial from F, are the points of 11. 12. 9. and 8. houses of heaven, thorough which draw paralels to the Meridian or houre of 12, as are IX and VIII the prickt lines in the Horizontall, and you have your desire.

In the East and West, let LO 1277 the secant of 28 d, 38', the complement of the elevation of the pole, be the Radius, then shall the Æquator K D E be a tangent line thereunto, and the naturall tangents of 577 for 30 d. and of 1732 for 60 d. set downwards upon the Equinoctiall line from A to m and h, are the points of the 30 and 60 circle of position, thorough which points draw paralels to the horizontall line, as are xii and xi in the Diall of the ninth Chapter, so have you your desire.

In East and West reclining, let S R I 1119 the secant of 26 d. 41' the heighth of the pole above the plane, in the Diall of the 12 Chapter, be Radius then shall the Æquator be a tangent line thereto, and the naturall tangent of 577 for 30 d. and 1732 for 60 d. set each wayes upon the Equinoctiall line from the point R of the substile, afford you pricks, by which draw paralels, either

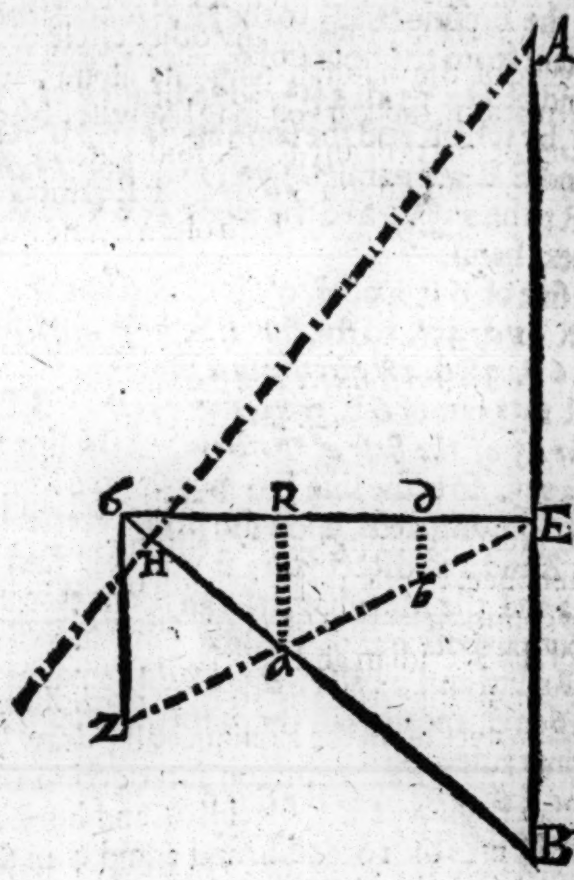
ter to the horizontall, or Meridian line of the Diall, so have you your desire: and as these, so may any other circle of position be inserted by helpe of the naturall tangents alone, without any trouble of calculation, though you may likewise, by giving each Radius in knowne parts of any scale, find out the distances of these circles of position, upon the severall Equinoctiall lines in the knowne parts of any scale: as hath often beene shewed heretofore.

South and North erect, and declining, South and North reclining, and declining reclining.

In all the rest, *viz.* the South and North erect, and declining, the South and North reclining, and declining reclining, J might particularly instance, but that one generall rule will serve for all: for seeing the common section of every circle of position, is the intersection of the Meridian and Horizon, and each particular section of the domifying circles, is 30 d. & 60 d. distant from the Meridian, both wayes upon the Equinoctiall; draw but straight lines from the point of their common intersection in the Diall (which is in the crossing of the Meridian and horizontall line) thorough the houres of 10 and 8. and 2 and 4 in the Equinoctiall, which are alwayes 30 d. & 60 d. distant from the Meridian, and you have your desire.

But if the Diall want a center, as in the example of the eleventh Chapter it doth, then is the Meridian also wanting, whose intersection with the horizontall line should helpe you; in which case you may find two other points, one in the prime verticall, and another in a paralell thereto, so shall you have three points, (these in the Equinoctiall at 10 and 8 remayning certaine) by which to draw each circle of position, without respect to the intersection of the Meridian and Horizon, though being continued beyond the plane, they will also meet therein.

In the Diagram adjoyning, let A E B be the Meridian, 6 R D E the horizontall line, A H the substile, 6 H a B the Equinoctiall, E b a Z the circle of position, 6 Z the prime verticall, R a and d b



two paralels thereunto, in which I seeke points to draw the circle of position by; and note, that though for demonstration sake I instance in this small Diagram, yet hath the operations reference to the Diall of the 11 Chapter, wherein let HO be the Radius, then shall 6 H be the naturall tangent of 5 degrees 00$\underline{87}$, and H B the naturall tangent of 85 degrees. 11$\underline{43}$ which added together, give the whole length of the Equinoctiall line 6 a B 11$\underline{517}$ from 6 of clock to the Meridian, by that line, and the angle at B 51 d. 40'. the complement of H A E, you may find 6 E to be 90$\underline{34}$. *by the first Case of R. P. triangles.* For

As the sine of 6 E B 90 *d*. 0'. *is to the line* 6 B 11$\underline{517}$.
So is the sine of 6 B E 51 *d*. 40'. *to the line* 6 E 90$\underline{34}$.

Then

Then raise a perpendicular from a (the intersection of 10 of clock upon the Equinoctiall) to the Horizontall line at R, which is 60 d. distant from the houre of 6, the naturall tangent of 6 H. 5 d. 0087 and of H a 55 d. 1428, added together, give the line 6 a, 1515, by which and the same angle at a of 51 d. 40′. (because R a and E B are paralels) you may find, *by the former case*, the line 6 R to be 1188, and the angle R 6 a 38 d. 20′. and R a to be 940 next hand.

For as the sine of 6 R a 90 d. 0′. is to the line 6 a 1515. so is the sine of 6 a R 51 d. 40′. to the line 6 R 1188, and so is the sine of the angle a 6 R 38 d. 28′. to the line R a. 940.

Take 6 R 1188 out of 6 E 9034, there resteth R E 7846, then againe *by the 45 of the first of Pitiscus*, as the line E R 7846 is to the line R a 940. so is the line E 6 9034 to the line 6 Z 1082, set 1082 from 6 downwards upon the prime verticall, so have you the point Z and a to direct you; if you will find another point betweene a and the Meridian, take any convenient part that you will for your purpose out of the line 9034 suppose 2500, that is twice the Radius and a halfe, there will remayne d E 6534: set 2500 from 6 to d, and let fall the perpendicular d b, then againe by the former rule.

As the line E 6 9034 *is to the line* 6 Z 1082.
So is the line e d 6534 *to the line* d b 783.

set 783 from d to b, the third point shall be at b to draw the circle of position E b a z, without the helpe of the intersection of the Meridian and Horizontall line at E, which falleth not upon the plane at all.

And thus must you worke in all respects for the other circle of position passing by the eighth of clocke houre.

The particular operations are as followeth.

				Logar.
		Tang. *As the sine of* 6 E B	90 *d.* 0′.	10000.00
1 { 6 H.	5 *d.* 0′. 087	*is to* 6 B	11517	1061.34
HB	85 0. 11430	*so is the sine* 6 B E	51 40	9894.55
6 H B	11517	*to* 6 E	9034	10955.89

Tang. *Logar.*

2 6H 5 *d.* 0′.087 *As the sine of* 6Ra 90 *d.* 0′. +10000
Ha 55 0 1428 *To* 6a 1515 + 0180
6Ha 1515 *So the sine of* baR 51 40 989
And so the sine of abR 38 20 979
To 6R 1188 + 0074
And to Ra 940 — 19972
0.cha.co

parts *Logar.*

3 6E 9034 *As* RE 7846 +0894.65
6R 1188 *To* Ra 940 —0027.03
RE 7846 *So* E6 9034 +0955.89
To 6Z 1082 + 0034.21

4 6e 9034 *As* e6 9034 + 9044.10. *Arith. Comple.*
6d 2500 *To* 6Z 1082 + 0034.21
de 6534 *So* ed 6574 + 0815.18
To db 783 — 9893.49
0. *compl. charact.*

Almicant.	Naturall Tangents	A Table for the Almicanters proper to the Diall of the eleventh Chapter.		
d				
10	176	Radius for the 20 Azimuth to the North is the secant	Radius for the first Azimuth the secant	Radius for the 20 Azimuth to the Southward the secant
20	364			
30	577			
40	839			
50	1192	1116	1006	1029

Radius for the 40 Azimuth the secant	Radius for the 60 Azimuth the secant	Radius for the 70 Azimuth the secant
1301	1886	2350

This

The Table following giveth the angles, which the houre lines [make] with the Equinoctiall upon the Trigon, as in the 27 Chap-[ter], and also which the Azimuths make with the Horizon, as in [the] 31 Chapter, and is calculated of purpose, to facilitate the [wor]ke in describing the paralels of the Signes, Diurnall Arches, [and] Almicanters upon each severall plane. The Canon to make [is] this, *by the first or second of the second Case of R. S. Tri-[ang]les.*

As the Radius,
Is to the Cosine of the houres distance from the Meridian,
So is the Cotangent of the elevation of the Pole,
To the tangent of the arch for that houres distance.

Example for 2 or 10 of clocke in the latitude 9 d. 20'.

			Logar.
As the sine of	90 *d.*	0'	10000.00
Is to the Cosine of	30	0	9937.53
So is the cotangent of	9	20	10784.22
To the tangent of	79	15	10721.75

By the same rule this Table might be continued to parts of houres also, which would be usefull for divers other purposes.

Houres

Houres		12		1. 11.		Compl.		2. 10.		Compl.	
Latit.		G.	M.	G.	M.	G.	M.	G.	M.	G.	M.
0	0	90	0	90	0	0	0	90	0	0	0
	5	89	55	89	55	0	5	89	54	0	6
	10		50		50	0	10		48	0	11
	15		45		44	0	16		43	0	17
	20		40		39	0	21		37	0	23
	25		35		34	0	26		31	0	29
	30		30		29	0	31		25	0	35
	35		25		24	0	36		20	0	40
	40		20		19	0	41		14	0	46
	45		15		13	0	47		8	0	52
	50		10		8	0	52		2	0	58
	55		5		3	0	57	88	56	1	4
1	0		0	88	58	1	2		51	1	9
	5	88	55		53	1	7		45	1	15
	10		50		48	1	12		39	1	21
	15		45		42	1	18		33	1	27
	20		40		37	1	23		28	1	32
	25		35		32	1	28		22	1	38
	30		30		27	1	33		16	1	44
	35		25		22	1	38		10	1	50
	40		20		16	1	44		5	1	55
	45		15		11	1	49	87	59	2	1
	50		10		6	1	54		53	2	7
	55		5		1	1	59		47	2	13
2	0		0	87	56	2	4		41	2	19
	5	87	55		51	2	9		36	2	24
	10		50		45	2	15		30	2	30
	15		45		40	2	20		24	2	36
	20		40		35	2	25		18	2	42
	25		35		30	2	30		13	2	47
	30		30		25	2	35		7	2	53
	35		25		20	2	40		1	2	59
	40		20		14	2	46	86	55	3	5
	45		15		9	2	51		50	3	10
	50		10		4	2	56		44	3	16
	55		5	86	50	2	1		38	3	22
Azimuths				15 d. 0'.				30 d. 0'.			

[illegible]	3. 9. G.	M.	Compl. G.	M.	4. 8. G.	M.	Compl. G.	M.	5. 7. G.	M.	Compl. G.	M.
0	90	00	0	0	90	0	0	0	90	0	0	0
5	89	53	0	7	89	50	0	10	89	41	0	19
10		46	0	14		40	0	20		21	0	39
15		39	0	21		30	0	30		2	0	58
20		32	0	28		20	0	40	88	43	1	17
25		25	0	35		10	0	50		23	1	37
30		18	0	42		0	0	0		4	1	56
35		10	0	50	88	50	1	10	87	45	2	15
40		3	0	57		40	1	20		26	2	34
45	88	56	1	4		30	1	30		6	2	54
50		49	1	11		20	1	40	86	47	3	13
55		42	1	18		10	1	50		28	3	32
0		35	1	25		0	2	0		9	3	51
5		28	1	32	87	50	2	10	85	49	4	11
10		21	1	39		40	2	20		30	4	30
15		14	1	46		30	2	30		11	4	49
20		7	1	53		20	2	40	84	52	5	8
25		0	2	0		10	2	50		33	5	27
30	87	53	2	7		0	2	0		13	5	47
35		46	2	14	86	50	3	10	83	54	6	6
40		39	2	21		40	3	20		35	6	25
45		32	2	28		30	3	30		16	6	44
50		24	2	36		20	3	40	82	57	7	3
55		17	2	43		10	3	50		38	7	22
0		10	2	50		0	4	0		19	7	41
5		3	2	57	85	50	4	10		0	8	0
10	86	56	3	4		40	4	20	81	41	8	19
15		49	3	11		30	4	30		22	8	38
20		42	3	18		20	4	40		3	8	57
25		35	3	25		11	4	49	80	44	9	16
30		28	3	32		1	4	59		25	9	35
35		21	3	39	84	51	5	9		7	9	53
40		14	3	46		41	5	19	79	48	10	12
45		7	3	53		31	5	29		29	10	31
50	86	0	4	0		21	5	39		10	10	50
55		53	4	7		11	5	49	78	52	11	8

Azimuths 45 d. 0'. 60 d. 0'. 75 d. 0'.

Houres		12.		1. 11.		Compl.		2. 10.		Compl.	
Latit.		G.	M.	G.	M.	G.	M.	G.	M.	G.	M.
3	0	87	0	86	54	3	6	86	32	3	28
	5	86	55		48	3	12		26	3	34
	10		50		43	3	17		21	3	39
	15		45		38	3	22		15	3	45
	20		40		33	3	27		9	3	51
	25		35		28	3	32		3	3	57
	30		30		23	3	37	85	58	4	2
	35		25		17	3	43		52	4	8
	40		20		12	3	48		46	4	14
	45		15		7	3	53		40	4	20
	50		10		2	3	58		35	4	25
	55		5	85	57	4	3		29	4	31
4	0		0		52	4	8		23	4	37
	5	85	55		46	4	14		17	4	43
	10		50		41	4	19		11	4	49
	15		45		36	4	24		6	4	54
	20		40		31	4	29		0	5	0
	25		35		26	4	34	84	54	5	6
	30		30		21	4	39		48	5	12
	35		25		15	4	45		43	5	17
	40		20		10	4	50		37	5	23
	45		15		5	4	55		31	5	29
	50		10		0	5	0		25	5	35
	55		5	84	55	5	5		20	5	40
5	0		0		49	5	11		14	5	46
	5	84	55		34	5	16		8	5	52
	10		50		39	5	21		2	5	58
	15		45		34	5	26	83	57	6	3
	20		40		29	5	31		51	6	9
	25		35		24	5	36		45	6	15
	30		30		18	5	42		39	6	21
	35		25		13	5	47		34	6	26
	40		20		8	5	52		28	6	32
	45		15		3	5	57		22	6	38
	50		10	83	58	6	2		16	6	44
	55		5		53	6	7		11	6	49
Azimuths				15 *d.* 0'.				30 *d.* 0.			

Houres	3. 9. G.	M.	Compl. G.	M.	4. 8. G.	M.	Compl. G.	M.	5. 7. G.	M.	Compl. G.	M.
0	85	46	4	14	84	1	5	59	78	33	11	27
5		39	4	21	83	51	6	9		15	11	45
10		32	4	28		41	6	19	77	56	12	4
15		25	4	35		31	6	29		38	12	22
20		17	4	43		21	6	39		19	12	41
25		10	4	50		11	6	49		1	12	59
30		3	4	57		2	6	58	76	42	13	18
35	84	56	5	4	82	52	7	8		24	13	36
40		49	5	11		42	7	18		6	13	54
45		42	5	18		32	7	28	75	47	14	13
50		35	5	25		22	7	38		29	14	31
55		28	5	32		12	7	48		11	14	49
0		21	5	39		2	7	58	74	53	15	7
5		14	5	46	81	52	8	8		35	15	25
10		7	5	53		43	8	17		17	15	43
15		0	6	0		33	8	27	73	59	16	1
20	83	53	6	7		23	8	37		41	16	19
25		46	6	14		13	8	47		23	16	37
30		39	6	21		3	8	57		5	16	55
35		32	6	28	80	53	9	7	72	47	17	13
40		24	6	35		44	9	16		30	17	30
45		18	6	42		34	9	26		12	17	48
50		11	6	49		24	9	36	71	54	18	6
55		4	6	56		14	9	46		37	18	23
0	82	57	7	3		4	9	56		19	18	41
5		50	7	10	79	55	10	5		2	18	58
10		43	7	17		45	10.15		70	45	19	15
15		36	7	24		35	10.25			27	19	33
20		29	7	31		25	10.35			10	19	50
25		22	7	38		16	10.44		69	53	20	7
30		15	7	45		6	10.54			36	20	24
35		8	7	52	78	56	11	4		18	20	42
40		1	7	59		47	11.13			1	20	59
45	81	54	8	6		37	11.23		68	44	21	16
50		47	8	13		27	11.33			28	21	32
55		40	8	30		17	11.43			11	21	49
Azimuths.	45 *d.* 0'.				60 *d.* 0'.				75 *d.* 0'.			

Houres		12.		1. 11.		Compl.		2. 10.		Compl.	
Latit.		G.	M.	G.	M.	G.	M.	G.	M.	G.	M.
6	0	84	0	83	47	6	13	83	5	6	[illegible]
	5	83	55		42	6	18	82	59	7	[illegible]
	10		50		37	6	23		53	7	[illegible]
	15		45		32	6	28		48	7	[illegible]
	20		40		27	6	33		42	7	[illegible]
	25		35		22	6	38		36	7	[illegible]
	30		30		16	6	44		30	7	[illegible]
	35		25		11	6	49		25	7	[illegible]
	40		20		6	6	54		19	7	[illegible]
	45		15		1	6	59		13	7	47
	50		10	82	56	7	4		7	7	53
	55		5		51	7	9		2	7	58
7	0		0		45	7	15	81	56	8	4
	5	82	55		40	7	20		50	8	10
	10		50		35	7	25		44	8	16
	15		45		30	7	30		39	8	21
	20		40		25	7	35		33	8	27
	25		35		19	7	41		27	8	33
	30		30		14	7	46		21	8	39
	35		25		9	7	51		16	8	44
	40		20		4	7	56		10	8	50
	45		15	81	59	8	1		4	8	56
	50		10		54	8	6	80	58	9	2
	55		5		48	8	12		53	9	7
8	0		0		43	8	17		47	9	13
	5	81	55		38	8	22		41	9	19
	10		50		33	8	27		35	9	25
	15		45		28	8	32		30	9	30
	20		40		23	8	37		24	9	36
	25		35		17	8	43		18	9	42
	30		30		12	8	48		13	9	47
	35		25		7	8	53		7	9	53
	40		20		2	8	58		1	9	59
	45		15	80	57	9	3	79	55	10	5
	50		10		52	9	8		50	10	10
	55		5		46	9	14		44	10	16
Azimuths				15 d. 0'.				30 d. 0'.			

	3. 9.		Compl.		4. 8.		Compl.		5. 7.		Compl.	
	G.	M.	G.	M.	G.	M.	G.	M.	G.	M.	G.	M.
0	81	33	8	27	78	8	11	52	67	54	22	6
5		26	8	34	77	58	12	2		37	22	23
10		19	8	41		48	12	12		20	22	40
15		12	8	48		39	12	21		4	22	56
20		5	8	55		29	12	31	66	47	23	13
25	80	58	9	2		19	12	41		31	23	29
30		51	9	9		10	12	50		14	23	46
35		44	9	16		0	13	0	65	58	24	2
40		37	9	23	76	51	13	9		42	24	18
45		30	9	30		41	13	19		26	24	34
50		23	9	37		31	13	29		9	24	51
55		16	9	44		22	13	38	64	53	25	7
7 0		9	9	51		12	13	48		37	25	23
5		2	9	58		3	13	57		21	25	39
10	79	55	10	5	75	53	14	7		5	25	55
15		48	10	12		43	14	17	63	49	26	11
20		41	10	19		34	14	26		34	26	26
25		34	10	26		24	14	36		18	26	42
30		27	10	33		15	14	45		2	26	58
35		20	10	40		5	14	55	62	47	27	13
40		13	10	47	74	56	15	4		31	27	29
45		6	19	54		46	15	14		16	27	44
50	78	59	11	1		37	15	23		0	27	0
55		52	11	8		27	15	33	61	45	28	15
8 0		46	11	14		18	15	42		30	28	30
5		39	11	21		9	15	51		15	28	45
10		32	11	28	73	59	16	1		0	29	0
15		25	11	35		50	16	10	60	45	29	15
20		18	11	42		40	16	20		30	29	30
25		11	11	49		31	16	29		15	29	45
30		4	11	56		22	16	38		0	29	0
35	77	57	12	3		12	16	48	59	45	30	15
40		50	12	10		3	16	57		30	30	30
45		43	12	17	72	53	17	7		16	30	44
50		36	12	24		44	17	16		1	30	59
55		29	12	31		35	17	25	58	47	31	13
Azimuths. 45 *d.* 0′.					60 *d.* 0′.				75 *d.* 0′.			

Houres	12.		1. 11.		Compl.		2. 10.		Compl.	
Latit.	G.	M.	G.	M.	G.	M.	G.	M.	G.	M.
9 0	81	0	80	41	9	19	79	38	10	22
5	80	55		36	9	24		32	10	28
10		50		31	9	29		27	10	33
15		45		26	9	34		21	10	39
20		40		21	9	39		15	10	45
25		35		15	9	45		10	10	50
30		30		10	9	50		4	10	56
35		25		5	9	55	78	58	11	2
40		20		0	10	0		52	11	8
45		15	79	55	10	5		47	11	13
50		10		50	10	10		41	11	19
55		5		44	10	16		35	11	25
10 0		0		39	10	21		29	11	31
5	79	55		34	10	26		24	11	36
10		50		29	10	31		18	11	42
15		45		24	10	36		12	11	48
20		40		19	10	41		7	11	53
25		35		13	10	47		1	11	59
30		30		8	10	52	77	55	12	5
35		25		3	10	57		49	12	11
40		20	78	58	11	2		44	12	16
45		15		53	11	7		38	12	22
50		10		48	11	12		32	12	28
55		5		42	11	18		27	12	33
11 0	79	0		37	11	23		21	12	39
5	78	55		32	11	28		15	12	45
10		50		27	11	33		10	12	50
15		45		22	11	38		4	12	56
20		40		17	11	43	76	58	13	2
25		35		11	11	49		52	13	8
30		30		6	11	54		47	13	13
35		25		1	11	59		41	13	19
40		20	77	56	12	4		35	13	25
45		15		51	12	9		30	13	30
50		10		46	12	14		24	13	36
55		5		41	12	19		18	13	42
Azimuths			15 *d.* 0'.				30 *d.* 0'.			

Houres.		3. 9.		Compl.		4. 8.		Compl.		5. 7.		Compl.	
Latit.		G.	M.	G.	M.	G.	M.	G.	M.	G.	M.	G.	M.
9	0	77	22	12	38	72	25	17	35	58	32	31	28
	5		16	12	44		16	17	44		18	31	42
	10		9	12	51		7	17	53		3	31	57
	15		2	12	58	71	58	18	2	57	49	32	11
	20	76	55	13	5		48	18	12		35	32	25
	25		48	13	12		39	18	21		21	32	39
	30		41	13	19		30	18	30		7	32	53
	35		34	13	26		20	18	40	56	53	33	7
	40		27	13	33		11	18	49		39	33	21
	45		20	13	40		2	18	58		25	33	35
	50		14	13	46	70	53	19	7		11	33	49
	55		7	13	53		44	19	16	55	58	34	2
10	0		0	14	0		34	19	26		44	34	16
	5	75	53	14	7		25	19	35		31	34	29
	10		46	14	14		16	19	44		17	34	43
	15		39	14	21		7	19	53		4	34	56
	20		32	14	28	69	58	20	2	54	50	35	10
	25		26	14	34		49	20	11		37	35	23
	30		19	14	41		40	20	20		24	35	36
	35		12	14	48		31	20	29		10	35	50
	40		5	14	55		22	20	38	53	57	36	3
	45	74	58	15	2		12	20	48		44	36	16
	50		51	15	9		3	20	57		31	36	29
	55		45	15	15	68	54	21	6		18	36	42
11	0		38	15	22		45	21	15		6	36	54
	5		31	15	29		36	21	24	52	53	37	7
	10		24	15	36		27	21	33		40	37	20
	15		17	15	43		18	21	42		27	37	33
	20		10	15	50		9	21	51		15	37	45
	25		4	15	56		0	21	0		2	37	58
	30	73	57	16	3	67	52	22	8	51	50	38	10
	35		50	16	10		43	22	17		37	38	23
	40		43	16	17		34	22	25		25	38	35
	45		36	16	24		25	22	35		13	38	47
	50		30	16	30		16	22	44		1	38	59
	55		23	16	37		7	22	53	50	48	39	12
Azimuths		45 d. 0'.				60 d. 0'.				75 d. 0'.			

Houres		12.		1. 11.		Compl.		2. 10.		Compl.	
Latit.		G.	M.	G.	M.	G.	M.	G.	M.	G.	M.
12	0	78	0	77	35	12	25	76	13	13	47
	5	77	55		30	12	30		7	13	53
	10		50		25	12	35		1	13	59
	15		45		20	12	40	75	56	14	4
	20		40		15	12	45		50	14	10
	25		35		10	12	50		44	14	16
	30		30		4	12	56		38	14	22
	35		25	76	59	13	01		33	14	27
	40		20		54	13	06		27	14	33
	45		15		49	13	11		21	14	39
	50		10		44	13	16		16	14	44
	55		5		39	13	21		10	14	50
13	0		0		33	13	27		4	14	56
	5	76	55		28	13	32	74	59	15	01
	10		50		23	13	37		53	15	07
	15		45		18	13	42		47	15	13
	20		40		13	13	47		42	15	18
	25		35		8	13	52		36	15	24
	30		30		3	13	57		30	15	30
	35		25	75	57	14	03		25	15	35
	40		20		52	14	08		19	15	41
	45		15		47	14	13		13	15	47
	50		10		42	14	18		8	15	52
	55		5		37	14	23		2	15	58
14	0		0		32	14	28	73	56	16	04
	5	75	55		26	14	34		51	16	09
	10		50		21	14	39		45	16	15
	15		45		16	14	44		39	16	21
	20		40		11	14	49		34	16	26
	25		35		6	14	54		28	16	32
	30		30		1	14	59		22	16	38
	35		25	74	56	15	04		17	16	43
	40		20		50	15	10		11	16	49
	45		15		45	15	15		5	16	55
	50		10		40	15	20		0	17	00
	55		5		34	15	25	72	54	17	06
Azimuths				15 *d.* 0'.				30 *d.* 0'.			

Heures	3.	9.	Compl.		4.	8.	Compl.		5.	7.	Compl.	
Latit.	G.	M	G.	M.	G.	M.	G.	M.	G.	M.	G.	M.
12 0	73	16	16	44	66	58	23	2	50	36	39	24
5		9	16	51		49	23	11		24	39	36
10		3	16	57		40	23	20		12	39	48
15	72	56	17	4		32	23	28		0	40	0
20		49	17	11		23	23	37	49	49	40	11
25		42	17	18		14	23	46		37	40	23
30		36	17	24		5	23	55		25	40	35
35		29	17	31	65	57	24	03		13	40	47
40		22	17	38		48	24	12		2	40	58
45		15	17	45		39	24	21	48	50	41	10
50		9	17	51		30	24	30		39	41	21
55		2	17	58		22	24	38		27	41	33
13 0	71	55	18	05		13	24	47		16	41	44
5		48	18	12		4	24	56		5	41	55
10		42	18	18	64	56	25	04	47	53	42	7
15		35	18	25		47	25	13		42	42	18
20		28	18	32		38	25	22		31	42	29
25		21	18	38		30	25	30		20	42	40
30		15	18	45		21	25	39		9	42	51
35		8	18	52		13	25	47	46	58	43	2
40		1	18	59		4	25	56		47	43	13
45	70	55	19	05	63	55	26	05		36	43	24
50		48	19	12		47	26	13		27	43	34
55		41	19	19		38	26	22		15	43	45
14 0		35	19	25		30	26	30		4	43	56
5		28	19	32		21	26	39	45	54	44	6
10		21	19	39		13	26	47		43	44	17
15		15	19	45		4	26	56		33	44	27
20		8	19	52	62	56	27	04		22	44	38
25		1	19	59		47	27	13		12	44	48
30	69	55	20	05		39	27	21		1	44	59
35		48	20	12		31	27	29	44	51	45	9
40		41	20	19		22	27	38		41	45	19
45		35	20	25		14	27	46		31	45	29
50		28	20	32		5	27	54		21	45	39
55		21	20	39	61	57	28	03		10	45	49
Azimuths.	45 d. 0'.				60 d. 0'.				75 d. 0'.			

Houres		12.		1. 11.		*Compl.*		2. 10.		*Compl.*	
Latit.		G.	M.	G.	M.	G.	M.	G.	M.	G.	M.
15	0	75	0	74	30	15	30	27	48	17	12
	5	74	55		25	15	35		43	17	17
	10		50		19	15	41		37	17	23
	15		45		14	15	46		32	17	29
	20		40		9	15	51		26	17	34
	25		35		4	15	56		20	17	40
	30		30	73	59	16	01		15	17	45
	35		25		54	16	06		9	17	51
	40		20		49	16	11		3	17	57
	45		15		43	16	17	71	58	18	02
	50		10		38	16	22		52	18	08
	55		5		33	16	27		46	18	14
16	0		0		28	16	32		41	18	19
	5	73	55		23	16	37		35	18	25
	10		50		18	16	42		30	18	30
	15		45		13	16	47		24	18	36
	20		40		7	16	53		18	18	41
	25		35		2	16	58		13	18	47
	30		30	72	57	17	03		7	18	53
	35		25		52	17	08		1	18	59
	40		20		47	17	13	70	56	19	04
	45		15		42	17	18		50	19	10
	50		10		36	17	24		45	19	15
	55		5		31	17	29		39	19	21
17	0		0		26	17	34		34	19	27
	5	72	55		21	17	39		28	19	32
	10		50		16	17	44		22	19	38
	15		45		11	17	49		16	19	43
	20		40		6	17	54		11	19	49
	25		35		0	18	0		5	19	55
	30		30	71	55	18	05		0	20	00
	35		25		50	18	10	69	54	20	06
	40		20		45	18	15		48	20	12
	45		15		40	18	20		43	20	17
	50		10		35	18	25		37	20	23
	55		5		30	18	30		32	20	28
Azimuths				15 *d.*0'.				30 *d.*0'.			

Heures	3.	9.	Compl.		4.	8.	Compl.		5.	7.	Compl.	
Latit.	G.	M.	G.	M.	G.	M.	G.	M.	G.	M.	G.	M.
15 0	69	15	20	45	61	49	28	11	44	0	46	0
5		8	20	52		41	28	19	43	50	46	9
10		2	20	58		32	28	28		41	46	19
15	68	55	21	05		24	28	36		31	46	29
20		48	21	12		16	28	44		21	46	39
25		42	21	18		7	28	53		11	46	49
30		35	21	25	60	59	29	01		1	46	59
35		29	21	32		51	29	09	42	52	47	8
40		22	21	38		43	29	17		42	47	18
45		15	21	45		34	29	26		33	47	27
50		9	21	51		26	29	34		23	47	37
55		2	21	58		18	29	42		14	47	46
16 0	67	56	22	04		10	29	50		4	47	56
5		49	22	11		2	29	58	41	55	48	5
10		42	22	18	59	54	30	06		46	48	14
15		36	22	24		46	30	14		36	48	24
20		29	22	31		38	30	22		27	48	33
25		23	22	37		29	30	31		18	48	42
30		16	22	44		21	30	39		9	48	51
35		10	22	50		13	30	47		0	49	0
40		3	22	57		5	30	55	40	51	49	9
45	66	57	23	03	58	57	31	03		42	49	18
50		50	23	10		49	31	11		33	49	27
55		44	23	16		41	31	19		24	49	36
17 0		37	23	23		33	31	27		15	49	45
5		31	23	29		25	31	35		6	49	54
10		24	23	36		17	31	43	39	57	50	3
15		18	23	42		10	31	50		49	50	11
20		11	23	49		2	31	58		40	50	20
25		5	23	55	57	54	32	06		31	50	29
30	65	58	24	02		46	32	14		23	50	37
35		52	24	08		38	32	22		14	50	46
40		45	24	15		30	32	30		6	50	54
45		39	24	21		22	32	38	38	57	51	3
50		32	24	28		15	32	45		49	51	11
55		26	24	34		7	32	53		41	51	19
Azimuths.	45 d. 0'.						60 d. 0'.				75 d. 0'.	

Houres Latit.		12. G.	M.	1. 11. G.	M.	Compl. G.	M.	2. 10. G.	M.	Compl. G.	M.
18	0	71	0	71	24	18	36	69	26	20	34
	5	71	55		19	18	41		20	20	40
	10		50		14	18	46		15	20	45
	15		45		9	18	51		9	20	51
	20		40		4	18	56		4	20	56
	25		35	70	59	19	01	68	58	21	02
	30		30		54	19	06		53	21	07
	35		25		48	19	11		47	21	13
	40		20		43	19	17		41	21	19
	45		15		38	19	22		36	21	24
	50		10		33	19	27		30	21	30
	55		5		28	19	32		25	21	35
19	0		0		23	19	37		19	21	41
	5	70	55		18	19	42		13	21	47
	10		50		13	19	47		8	21	52
	15		45		7	19	53		2	21	58
	20		40		2	19	58	67	57	22	03
	25		35	69	57	20	03		51	22	09
	30		30		52	20	08		46	22	14
	35		25		46	20	13		40	22	20
	40		20		42	20	18		34	22	26
	45		15		37	20	23		29	22	31
	50		10		31	20	29		23	22	37
	55		5		26	20	34		18	22	42
20	0		0		21	20	39		12	22	48
	5	69	55		16	20	44		7	22	53
	10		50		11	20	49		1	22	59
	15		45		6	20	54	66	56	23	04
	20		40		1	20	59		50	23	10
	25		35	68	56	21	04		45	23	15
	30		30		50	21	10		39	23	21
	35		25		45	21	15		33	23	27
	40		20		40	21	20		28	23	32
	45		15		35	21	25		22	23	38
	50		10		30	21	30		17	23	43
	55		5		25	21	35		11	23	49
Azimuths				15 d. 0'.				30 d. 0'.			

Heures.	3. 9.		Compl.		4. 8.		Compl.		5. 7.		Compl.	
Latit.	G.	M.	G.	M.	G.	M.	G.	M.	G.	M.	G.	M.
18 0	65	19	24	41	56	59	33	01	38	32	51	28
5		13	24	47		51	33	09		24	51	36
10		6	24	54		43	33	17		16	51	44
15		0	25	00		36	33	24		8	51	52
20	64	53	25	07		28	33	32		0	52	0
25		47	25	13		20	33	40	37	51	52	9
30		41	25	19		13	33	47		43	52	17
35		34	25	26		5	33	55		35	52	25
40		28	25	32	55	57	34	03		27	52	33
45		21	25	39		50	34	10		19	52	41
50		15	25	45		42	34	18		12	52	48
55		9	25	51		34	34	26		4	52	56
19 0		2	25	58		27	34	33	36	56	53	4
5	63	56	26	04		19	34	41		48	53	12
10		49	26	11		12	34	48		40	53	20
15		43	26	17		4	34	56		33	53	27
20		37	26	23	54	57	35	03		25	53	35
25		30	26	30		49	35	11		17	53	43
30		24	26	36		42	35	18		10	53	50
35		18	26	42		34	35	26		2	53	58
40		11	26	49		27	35	33	35	55	54	5
45		5	26	55		19	35	41		47	54	13
50	62	58	27	02		12	35	48		40	54	20
55		52	27	08		4	35	56		32	54	28
20 0		46	27	14	53	57	36	03		25	54	35
5		39	27	20		49	36	11		18	54	42
10		33	27	27		42	36	18		10	54	50
15		27	27	33		35	36	25		3	54	57
20		21	27	39		27	36	33	34	56	55	4
25		14	27	46		20	36	40		49	55	11
30		8	27	52		13	36	47		42	55	18
35		2	27	58		5	36	55		34	55	26
40	61	55	28	05	52	58	36	02		27	55	33
45		49	28	11		51	36	09		20	55	40
50		43	28	17		44	36	16		13	55	47
55		36	28	23		36	36	24		6	55	54
Azimuths	45 d. 0'.				60 d. 0'.				75 d. 0'.			

Houres		12.		1. 11.		*Compl.*		2. 10.		*Compl.*	
Latit.		G.	M.	G.	M.	G.	M.	G.	M.	G.	M.
21	0	69	0	68	20	21	40	66	6	23	54
	5	68	55		14	21	46		0	24	00
	10		50		9	21	51	65	55	24	05
	15		45		4	21	56		49	24	11
	20		40	67	59	22	01		44	24	16
	25		35		54	22	06		38	24	22
	30		30		49	22	11		33	24	27
	35		25		44	22	16		27	24	33
	40		20		38	22	22		21	24	39
	45		15		33	22	27		16	24	44
	50		10		28	22	32		10	24	50
	55		5		23	22	37		5	24	55
22	0		0		18	22	42	64	59	25	01
	5	67	55		13	22	47		54	25	06
	10		50		8	22	52		48	25	12
	15		45		3	22	57		43	25	17
	20		40	66	58	23	02		37	25	23
	25		35		52	23	08		32	25	28
	30		30		47	23	13		26	25	34
	35		25		42	23	18		21	25	39
	40		20		37	23	23		15	25	45
	45		15		32	23	28		10	25	50
	50		10		27	23	33		4	25	56
	55		5		22	23	38	63	59	26	01
23	0		0		17	23	43		53	26	07
	5	66	55		11	23	49		48	26	12
	10		50		6	23	54		42	26	18
	15		45		1	23	59		37	26	23
	20		40	65	56	24	04		31	26	29
	25		35		51	24	09		26	26	34
	30		30		46	24	14		20	26	40
	35		25		41	24	19		15	26	44
	40		20		36	24	24		9	26	51
	45		15		31	24	29		4	26	56
	50		10		25	24	35	62	58	27	02
	55		5		20	24	40		52	27	7
Azimuths				15 *d.* 0'.				30 *d.* 0'.			

ures.	3. 9.		Compl.		4. 8.		Compl.		5. 7.		Compl.	
atit.	G.	M.	G.	M.	G.	M.	G.	M.	G.	M.	G.	M.
21 0	61	30	28	30	52	29	37	31	33	59	56	1
5		24	28	36		22	37	38		52	56	8
10		18	28	42		15	37	45		46	56	14
15		11	28	49		8	37	52		39	56	21
20		5	28	55		0	38	0		32	56	28
25	60	59	29	01	51	53	38	07		25	56	35
30		53	29	07		46	38	14		18	56	42
35		46	29	14		39	38	21		12	56	48
40		40	29	20		32	38	28		5	56	55
45		34	29	26		25	38	35	32	58	57	2
50		28	29	32		18	38	42		52	57	8
55		22	29	38		11	38	49		45	57	15
22 0		15	29	45		4	38	56		39	57	21
5		9	29	51	50	57	39	03		32	57	28
10		3	29	57		50	39	10		26	57	34
15	59	57	30	03		43	39	18		19	57	41
20		51	30	09		36	39	24		13	57	47
25		44	30	16		29	39	31		6	57	54
30		38	30	22		22	39	38		0	58	0
35		32	30	26		15	39	45	31	54	58	6
40		26	30	34		8	39	52		47	58	13
45		29	30	40		1	39	59		41	58	19
50		14	30	46	49	54	40	06		35	58	25
55		8	30	52		47	40	13		29	58	31
23 0		1	30	59		40	40	20		22	58	38
5	58	55	31	05		33	40	27		16	58	44
10		49	31	11		26	40	34		10	58	50
15		43	31	17		20	40	40		4	58	56
20		37	31	23		13	40	47	30	58	59	2
25		31	31	29		6	40	54		52	59	8
30		25	31	35	48	59	41	01		46	59	14
35		19	31	41		53	41	07		40	59	20
40		12	31	47		45	41	14		34	59	26
45		6	31	54		39	41	21		28	59	32
50		0	32	00		32	41	28		22	59	38
55	57	54	32	6		26	41	34		16	59	44
Azimuths	45 d. 0'.				60 d. 0'.				75 d. 0'.			

Houres		12.		1. 11.		Compl.		2. 10.		Compl.	
Latit.		G.	M.	G.	M.	G.	M.	G.	M.	G.	M.
24	0	66	0	65	15	24	45	62	48	27	12
	5	65	55		10	24	50		42	27	18
	10		50		5	24	55		37	27	23
	15		45		0	25	00		31	27	29
	20		40	64	55	25	05		26	27	34
	25		35		50	25	10		20	27	40
	30		30		44	25	16		15	27	45
	35		25		39	25	21		9	27	51
	40		20		34	25	26		4	27	56
	45		15		29	25	31	61	58	28	02
	50		10		24	25	36		53	28	07
	55		5		19	25	41		47	28	13
25	0		0		14	25	46		42	28	18
	5	66	55		9	25	51		34	28	26
	10		50		4	25	56		31	28	29
	15		45	63	58	26	01		26	28	34
	20		40		53	26	07		20	28	40
	25		35		48	26	12		15	28	45
	30		30		43	26	17		9	28	51
	35		25		38	26	22		4	28	56
	40		20		33	26	27	60	57	29	03
	45		15		28	26	32		52	29	08
	50		10		23	26	37		47	29	13
	55		5		18	26	42		42	29	18
26	0		0		13	26	47		37	29	23
	5	67	55		7	26	53		31	29	29
	10		50		2	26	58		26	29	34
	15		45	62	57	27	03		20	29	40
	20		40		52	27	08		15	29	45
	25		35		47	27	13		10	29	50
	30		30		42	27	18		4	29	56
	35		25		37	27	23	59	59	30	01
	40		20		32	27	28		53	30	07
	45		15		27	27	33		48	30	12
	50		10		22	27	38		43	30	17
	55		5		16	27	44		37	30	23
Azimuths			15 *d*. 0'.						30 *d*. 0'.		

Houres Latit.		3. 9. G.	M.	Compl. G.	M.	4. 8. G.	M.	Compl. G.	M.	5. 7. G.	M.	Compl. G.	M.
24	0	57	48	32	12	48	19	41	41	30	10	59	50
	5		42	32	18		12	41	48		4	59	56
	10		36	32	24		6	41	54	29	59	60	01
	15		30	32	30	47	59	42	01		53	60	07
	20		24	32	36		52	42	08		47	60	13
	25		18	32	42		46	42	14		41	60	19
	30		12	32	48		39	42	21		36	60	24
	35		6	32	54		33	42	27		30	60	30
	40		0	33	00		26	42	34		24	60	36
	45	56	54	33	06		19	02	41		19	60	41
	50		48	33	12		13	42	47		13	60	47
	55		42	33	18		6	42	54		7	60	53
25	0		36	33	24		0	43	00		2	60	58
	5		30	33	30	46	53	43	07	28	56	61	04
	10		24	33	36		47	43	13		51	61	09
	15		18	33	42		40	43	20		45	61	15
	20		12	33	48		34	43	26		40	61	20
	25		6	33	54		27	43	33		35	61	25
	30		0	34	00		21	43	39		29	61	31
	35	55	54	34	06		15	43	45		24	61	36
	40		48	34	12		8	43	52		18	61	42
	45		42	34	18		2	43	58		13	61	47
	50		36	34	24	45	55	44	05		8	61	52
	55		30	34	30		49	44	11		2	61	58
26	0		24	34	36		43	44	17	27	57	62	03
	5		18	34	42		36	44	24		52	62	08
	10		12	34	48		30	44	30		47	62	13
	15		6	34	53		24	44	36		41	62	18
	20		0	34	59		17	44	43		36	62	24
	25	54	55	35	05		11	44	49		31	62	29
	30		49	35	11		5	44	55		26	62	34
	35		43	35	17		0	45	00		21	62	39
	40		37	35	23	44	53	45	07		16	62	44
	45		31	35	29		46	45	14		11	62	49
	50		25	35	35		40	45	20		6	62	54
	55		19	35	41		34	45	26		1	62	59

Houres		12		1. 11.		Compl.		2. 10		Compl.	
Latit.		G.	M.	G.	M.	G.	M.	G.	M.	G.	M.
27	0	63	0	62	11	27	49	59	32	30	28
	5	62	55		6	27	54		26	30	34
	10		50		1	27	59		21	30	39
	15		45	61	56	28	04		16	30	44
	20		40		51	28	09		10	30	50
	25		35		46	28	14		4	30	55
	30		30		41	28	19	58	59	31	01
	35		25		36	28	24		54	31	06
	40		20		30	28	29		49	31	11
	45		15		25	28	35		43	31	17
	50		10		20	28	40		38	31	22
	55		5		15	28	45		32	31	27
28	0		0		10	28	50		27	31	33
	5	61	55		5	28	55		22	31	38
	10		50		0	29	00		16	31	44
	15		45	60	55	29	05		11	31	49
	20		40		50	29	10		6	31	54
	25		35		45	29	15		0	32	00
	30		30		40	29	20	57	55	32	05
	35		25		34	29	26		50	32	10
	40		20		29	29	31		44	32	16
	45		15		24	29	36		39	32	21
	50		10		19	29	41		33	32	27
	55		5		14	29	46		28	32	32
29	0		0		9	29	51		23	32	37
	5	60	55		4	29	56		17	32	43
	10		50	59	59	30	01		12	22	48
	15		45		54	30	06		7	32	53
	20		40		49	30	11		1	32	59
	25		35		43	30	17	56	56	33	04
	30		30		38	30	22		51	33	09
	35		25		33	30	27		45	33	15
	40		20		28	30	32		40	33	20
	45		15		23	30	37		35	33	25
	50		10		18	30	42		29	33	31
	55		5		13	30	47		24	33	36

Azimuths 15 *d*. 0′. 30 *d*. 0′.

Houres Latit.		3. 9. G.	M.	Compl. G.	M.	4. 8. G.	M.	Compl. G.	M.	5. 7. G.	M.	Compl. G.	M.
27	0	54	13	35	47	44	28	45	32	26	56	63	04
	5		8	35	52		21	45	39		51	63	09
	10		2	35	58		15	45	45		46	63	14
	15	53	56	36	04		9	45	51		41	63	19
	20		50	36	10		3	45	57		36	63	24
	25		44	36	16	43	57	46	03		31	63	29
	30		38	36	22		51	46	09		26	63	34
	35		33	36	27		45	46	15		21	63	39
	40		27	36	33		39	46	21		16	63	44
	45		21	36	39		33	46	27		12	64	48
	50		15	36	45		26	46	34		7	63	53
	55		9	36	51		20	46	40		2	63	58
28	0		3	36	56		14	46	46	25	57	64	03
	5	52	58	37	02		8	46	52		53	64	07
	10		52	37	08		2	46	58		48	64	12
	15		46	37	14	42	56	47	04		43	64	17
	20		40	37	20		51	47	09		38	64	22
	25		35	37	25		45	47	15		34	64	26
	30		29	37	31		39	47	21		29	64	31
	35		23	37	37		33	47	27		25	64	35
	40		17	37	43		27	47	33		20	64	40
	45		12	37	48		21	47	39		15	64	45
	50		6	37	54		15	47	45		11	64	49
	55		0	38	00		9	47	51		6	64	54
29	0	51	54	38	06		3	47	57		2	64	58
	5		49	38	11	41	57	48	03	24	57	65	03
	10		43	38	17		51	48	09		53	65	07
	15		37	38	23		43	48	17		48	65	12
	20		31	38	28		40	48	20		44	65	16
	25		26	38	34		34	48	26		39	65	21
	30		20	38	40		28	48	32		35	65	25
	35		14	38	46		22	48	38		31	65	29
	40		9	38	51		17	48	43		26	65	34
	45		3	38	57		11	48	49		22	65	38
	50	50	57	39	03		5	48	55		17	65	43
	55		52	39	08	40	59	49	0		13	65	47
Azimuths						16d.0'.				16d.0'.			

Heures		12		1. 11.		Compl.		2. 10.		Compl.	
Latit.		G.	M.	G.	M.	G.	M.	G.	M.	G.	M.
30	0	60	0	59	8	30	52	56	19	33	41
	5	59	55		3	30	57		13	33	47
	10		50	58	58	31	02		8	33	52
	15		45		53	31	07		3	33	57
	20		40		48	31	12	55	57	34	03
	25		35		43	31	17		52	34	08
	30		30		37	31	23		47	34	13
	35		25		32	31	28		41	34	19
	40		20		27	31	33		36	34	24
	45		15		22	31	38		31	34	29
	50		10		17	31	43		25	34	35
	55		5		12	31	48		20	34	40
31	0		0		7	31	53		15	34	45
	5	58	55		2	31	58		9	34	51
	10		50	57	57	32	03		4	34	56
	15		45		52	32	08	54	59	35	01
	20		40		47	32	13		54	35	06
	25		35		42	32	18		48	35	12
	30		30		36	32	23		43	35	17
	35		25		31	32	29		38	35	22
	40		20		26	32	34		32	35	28
	45		15		21	32	39		27	35	33
	50		10		16	32	44		22	35	38
	55		5		11	32	49		17	35	43
32	0		0		6	32	54		11	35	49
	5	57	55		1	32	59		6	35	54
	10		50	56	56	33	04		1	35	59
	15		45		51	33	09	53	55	36	05
	20		40		46	33	14		50	36	10
	25		35		41	33	19		45	36	15
	30		30		36	33	24		40	36	20
	35		25		31	33	29		34	36	26
	40		20		25	33	35		29	36	31
	45		15		20	33	40		24	36	36
	50		10		15	33	45		19	36	41
	55		5		10	33	50		13	36	47
Azimuths				15 *d.* 0′.				30 *d.* 0′.			

Heures		3.		9. Compl.		4.		8. Compl.		5.		7. Compl.	
Latit.		G.	M.	G.	M.	G.	M.	G.	M.	G.	M.	G.	M.
30	0	50	46	39	14	40	54	49	06	24	9	65	51
	5		40	39	20		48	49	12		4	65	56
	10		35	39	25		42	49	18		0	65	00
	15		29	39	31		37	49	23	23	56	66	04
	20		23	39	37		31	49	29		52	66	08
	25		18	39	42		25	49	35		47	66	13
	30		12	39	48		20	49	40		43	66	17
	35		7	39	53		14	49	46		39	66	21
	40		1	39	59		8	49	52		35	66	25
	45	49	55	40	05		3	49	57		31	66	29
	50		50	40	10	39	57	50	03		26	66	34
	55		44	40	16		51	50	09		22	66	38
31	0		39	40	21		46	50	14		18	66	42
	5		33	40	27		40	50	20		14	66	46
	10		28	40	32		35	50	25		10	66	50
	15		22	40	38		29	50	31		6	66	54
	20		16	40	44		24	50	36		2	66	58
	25		11	40	49		18	50	42	22	58	67	02
	30		5	40	55		13	50	47		54	67	06
	35		0	41	00		7	50	53		50	67	10
	40	48	54	41	06		2	50	58		46	67	14
	45		49	41	11	38	56	51	04		42	67	18
	50		43	41	17		51	51	09		38	67	22
	55		37	41	22		45	51	15		34	67	26
32	0		32	41	28		40	51	20		30	67	30
	5		26	41	34		34	51	25		26	67	34
	10		21	41	39		29	51	31		22	67	38
	15		15	41	45		24	51	36		18	67	42
	20		10	41	50		18	51	42		14	67	46
	25		4	41	56		13	51	47		10	67	50
	30	47	59	42	01		8	51	52		7	67	53
	35		53	42	07		2	51	58		3	67	57
	40		48	42	12	37	57	52	03	21	59	68	01
	45		43	42	17		5[illegible]	52	08		55	68	05
	50		37	42	23		46	52	14		51	68	09
	55		32	42	28		41	52	19		48	68	12
Azimuths		45. d. 0'.				60 d. 0'.				75 d. 0'.			

Houres Latit.		12 G.	M.	1. 11. G.	M.	Compl. G.	M.	2. 10. G.	M.	Compl. G.	M.
33	0	57	0	56	5	33	55	53	8	36	52
	5	56	55		0	34	00		3	36	57
	10		50	55	55	34	05	52	58	37	02
	15		45		50	34	10		52	37	08
	20		40		45	34	15		47	37	13
	25		35		40	34	20		42	37	18
	30		30		35	34	25		37	37	23
	35		25		30	34	30		31	37	29
	40		20		25	34	35		26	37	34
	45		15		20	34	40		21	37	39
	50		10		15	34	45		16	37	44
	55		5		9	34	51		10	37	50
34	0		0		4	34	56		5	37	55
	5	55	55	54	59	35	01		0	38	00
	10		50		54	35	06	51	54	38	05
	15		45		49	35	11		50	38	10
	20		40		44	35	16		44	38	16
	25		35		39	35	21		39	38	21
	30		30		34	35	26		34	38	26
	35		25		29	35	31		29	38	31
	40		20		24	35	36		23	38	37
	45		15		19	35	41		18	38	42
	50		10		14	35	46		13	38	47
	55		5		9	35	51		8	38	52
35	0		0		4	35	56		3	38	57
	5	54	55	53	59	36	01	50	57	39	03
	10		50		54	36	06		52	39	08
	15		45		49	36	11		47	39	13
	20		40		43	36	17		42	39	18
	25		35		38	36	22		37	39	23
	30		30		33	36	27		31	39	29
	35		25		28	36	32		26	39	34
	40		20		23	36	37		21	39	39
	45		15		18	36	42		16	39	44
	50		10		13	36	47		11	39	49
	55		5		8	36	42		5	39	55
Azimuths				15 d. 0'.				30 d. 0'.			

Houres		3. 9.		Compl.		4. 8.		Compl.		5. 7.		Compl.	
Latit.		G.	M.	G.	M.	G.	M.	G.	M.	G.	M.	G.	M.
33	0	47	26	42	34	37	35	52	25	21	44	68	16
	5		21	42	39		30	52	30		40	68	20
	10		15	42	45		25	52	35		36	68	24
	15		10	42	50		20	52	40		33	68	27
	20		4	42	56		15	52	45		29	68	31
	25	46	59	43	01		9	52	51		25	68	35
	30		54	43	06		4	52	56		21	68	39
	35		48	43	12	36	59	53	01		18	68	42
	40		43	43	17		54	53	06		14	68	46
	45		37	43	23		48	53	12		10	68	50
	50		32	43	28		43	53	17		7	68	53
	55		26	43	34		38	53	22		3	68	57
32	0		21	43	39		33	53	27		0	69	00
	5		16	43	44		28	53	32	20	56	69	04
	10		10	43	50		23	53	37		52	69	08
	15		5	43	55		17	53	42		49	69	11
	20		0	44	00		12	53	48		45	69	15
	25	45	54	44	06		7	53	53		42	69	18
	30		49	44	11		2	53	58		38	69	22
	35		44	44	16	35	57	54	03		35	69	25
	40		38	44	22		52	54	08		31	69	29
	45		33	44	27		47	54	13		28	69	32
	50		28	44	32		42	54	18		24	69	36
	55		22	44	38		37	54	23		21	69	39
31	0		17	44	43		32	54	28		17	69	43
	5		12	44	48		27	54	33		14	69	46
	10		6	44	54		22	54	38		10	69	50
	15		1	44	59		17	54	43		7	69	53
	20	44	56	45	04		12	54	48		3	59	57
	25		50	45	10		7	54	53		0	70	00
	30		45	45	15		2	54	58		57	70	03
	35		40	45	20	34	57	55	03		53	70	07
	40		34	45	26		52	55	08		50	70	10
	45		29	45	31		47	55	13		46	70	14
	50		24	45	36		42	55	18		43	70	17
	55		19	45	41		37	55	23		40	70	20
Azimuths		45 d. 0'.				60 d. 0'.				75 d. 0'.			

Houres / *Latit.*		12 G.	M.	1. 11. G.	M.	*Compl.* G.	M.	2. 10. G.	M.	Co[illegible] G.	M.
36	0	54	0	53	3	36	57	50	0	39	59
	5		55	52	58	37	3	49	55	40	5
	10	53	50		53	37	7		50	40	10
	15		45		48	37	12		45	40	15
	20		40		43	37	17		40	40	20
	25		35		38	37	22		34	40	25
	30		30		33	37	27		29	40	31
	35		25		28	37	32		24	40	36
	40		20		23	37	37		19	40	41
	45		15		18	37	42		14	40	46
	50		10		13	37	47		9	40	51
	55		5		8	37	52		4	40	56
37	0		0		2	37	58	48	58	41	2
	5		55	51	57	38	3		53	41	7
	10	52	50		52	38	8		48	41	12
	15		45		47	38	13		43	41	17
	20		40		42	38	18		38	41	23
	25		35		37	38	23		33	41	27
	30		30		32	38	28		27	41	33
	35		25		27	38	33		22	41	38
	40		20		22	38	38		17	41	43
	45		15		17	38	43		12	41	48
	50		10		12	38	48		7	41	53
	55		5		7	38	53		2	41	58
38	0		0		2	38	58	47	57	42	3
	5	51	55	50	57	39	3		52	44	8
	10		50		52	39	8		46	42	13
	15		45		47	39	13		41	42	19
	20		40		42	39	18		36	42	24
	25		35		37	39	23		31	42	29
	30		30		32	39	28		26	42	34
	35		25		27	39	33		21	42	39
	40		20		22	39	38		16	42	44
	45		15		17	39	43		11	42	49
	50		10		12	39	48		6	42	54
	55		5		7	39	53		0	43	0
Azimuths				15 *d.* 0′.				30 *d.* 0′.			

Heures		3.	9.	Compl.		4.	8.	Compl.		5.	7.	Compl.	
Latit.		G.	M.	G.	M.	G.	M.	G.	M.	G.	M.	G.	M.
36	0	44	13	45	47	34	32	55	28	19	36	70	24
	5		8	45	52		27	55	33		33	70	27
	10		3	45	57		22	55	38		30	70	30
	15	43	58	46	2		17	55	43		27	70	33
	20		52	46	8		13	55	47		23	70	37
	25		47	46	13		8	55	52		20	70	40
	30		42	46	18		3	55	57		17	70	43
	35		37	46	23	33	58	56	2		13	70	47
	40		32	46	28		53	56	7		10	70	50
	45		26	46	34		48	56	12		7	70	53
	50		21	46	39		44	56	16		4	70	56
	55		16	46	44		39	56	21		1	70	59
37	0		11	46	49		34	56	26	18	57	71	3
	5		6	46	54		29	56	31		54	71	6
	10		0	47	0		24	56	36		51	71	9
	15	42	55	47	5		20	56	40		48	71	12
	20		50	47	10		15	56	45		45	71	15
	25		45	47	15		10	56	50		41	71	19
	30		40	47	20		5	56	55		38	71	22
	35		35	47	25		1	56	59		35	71	25
	40		29	47	31	32	56	57	4		32	71	28
	45		24	47	36		51	57	9		29	71	31
	50		19	47	41		46	57	14		26	71	34
	55		14	47	46		42	57	18		23	71	38
38	0		9	47	51		37	57	23		20	71	40
	5		4	47	56		32	57	28		17	71	43
	10	41	59	48	1		28	57	32		14	71	46
	15		53	48	7		23	57	37		11	71	49
	20		48	48	12		18	57	42		7	71	53
	25		43	48	17		14	57	46		4	71	56
	30		38	48	22		9	57	51		1	71	59
	35		33	48	27		5	57	55	17	58	72	2
	40		28	48	32		0	58	0		55	72	5
	45		23	48	37	31	55	58	5		52	72	8
	50		18	48	42		51	58	9		49	72	11
	55		13	48	47		46	58	14		46	72	14
Azimuths.		45 d. 0'.				60 d. 0'.				75 d. 0'.			

Houres Latit.		12.		1. 11.		Compl.		2. 10.		Compl.	
		G.	M.	G.	M.	G.	M.	G.	M.	G.	M.
39	0	51	0	50.	01	39	58	46	55	43	5
	5	50	55	49	56	40	4		50	43	10
	10		50		51	40	8		45	43	15
	15		45		46	40	14		40	43	20
	20		40		41	40	19		35	43	25
	25		35		36	40	24		30	43	30
	30		30		31	40	28		25	43	35
	35		25		26	40	34		20	43	40
	40		20		21	40	39		15	43	45
	45		15		16	40	44		10	43	50
	50		10		11	40	49		4	43	56
	55		5		6	40	53	45	59	44	1
40	0		0		1	40	59		54	44	6
	5	49	55	48	56	41	4		49	44	11
	10		50		51	41	9		44	44	16
	15		45		46	41	14		39	44	31
	20		40		41	41	19		34	44	36
	25		35		36	41	24		29	44	31
	30		30		31	41	29		24	44	36
	35		25		26	41	34		19	44	41
	40		20		21	41	39		14	44	46
	45		15		16	41	44		9	44	51
	50		10		11	41	49		4	44	56
	55		5		6	41	54	44	59	45	1
41	0		0		1	41	59		54	45	6
	5	48	55	47	56	42	4		48	45	11
	10		50		51	42	9		43	45	17
	15		45		46	42	14		38	45	22
	20		40		41	42	19		33	45	27
	25		35		36	42	24		28	45	32
	30		30		31	42	29		23	45	37
	35		25		26	42	34		18	45	42
	40		20		21	42	39		13	45	47
	45		15		16	42	44		8	45	52
	50		10		11	42	49		3	45	57
	55		5		5	42	55	43	58	46	2
Azimuths				15 *d.* 0′.				30 *d.* 0′.			

Latit.	3. 9. G.	M.	Compl. G.	M.	4. 6. G.	M.	Compl. G.	M.	5. 7. G.	M.	Compl. G.	M.
39 0	41	8	48	52	31	42	58	18	17	43	72	17
5		3	48	57		37	58	23		40	72	20
10	40	57	49	3		32	58	28		38	72	22
15		52	49	8		28	58	32		35	72	25
20		47	49	13		23	58	37		32	72	28
25		42	49	18		19	58	41		29	72	31
30		37	49	23		14	58	46		26	72	34
35		32	49	28		10	58	50		23	72	37
40		27	49	33		5	58	55		20	72	40
45		22	49	38		1	58	59		17	72	43
50		17	49	43	30	56	59	4		14	72	46
55		12	49	48		52	59	8		11	72	49
40 0		7	49	53		47	59	13		9	72	51
5		2	49	58		43	59	17		6	72	54
10	39	57	50	3		38	59	22		3	72	57
15		52	50	8		34	59	26		0	73	0
20		47	50	13		30	59	30	16	57	73	3
25		42	50	18		25	59	35		54	73	6
30		37	50	23		21	59	40		52	73	8
35		32	50	28		16	59	44		49	73	11
40		27	50	33		12	59	48		46	73	14
45		22	50	38		8	59	52		43	73	17
50		17	50	43		3	59	57		40	73	20
55		12	50	48	29	59	60	1		38	3	22
41 0		8	50	52		54	60	6		35	73	25
5		3	50	57		50	60	10		32	73	28
10	38	58	51	2		46	60	14		29	73	31
15		53	51	7		41	60	19		27	73	33
20		48	51	12		37	60	23		24	73	36
25		43	51	17		33	60	27		21	73	39
30		38	51	22		28	60	32		18	73	42
35		33	51	27		24	60	36		16	73	44
40		28	51	32		20	60	40		13	73	47
45		23	51	37		15	60	45		10	73	50
50		18	51	42		11	60	49		8	73	52
55		13	51	47		7	60	53		5	73	55
Azimuth.	45 d. 0'.				60 d. 0'.				75 d. 0'.			

Houres Latit.		12.		I. XI.		Compl.		I. XI.		Compl.	
		G.	M.	G.	M.	G.	M.	G.	M.	G.	M.
42	0	47	0	47	1	42	59	43	53	46	7
	5	46	55	46	56	43	4		48	46	12
	10		50		51	43	9		43	46	17
	15		45		46	43	14		38	46	22
	20		40		41	43	19		33	36	27
	25		35		36	43	24		28	46	32
	30		30		31	43	29		23	46	37
	35		25		26	43	34		18	46	42
	40		20		21	43	39		13	46	47
	45		15		15	43	45		8	46	52
	50		10		10	43	50		3	46	57
	55		5		5	43	55	42	58	47	2
43	0		0		0	44	0		53	47	7
	5	45	55	45	55	44	5		48	47	12
	10		50		50	44	10		43	47	17
	15		45		55	44	15		38	47	22
	20		40		40	44	20		33	47	27
	25		35		35	44	25		28	47	32
	30		30		30	44	30		23	47	37
	35		25		25	44	35		18	47	42
	40		20		20	44	40		13	47	47
	45		15		15	44	45		8	47	52
	50		10		10	44	50		3	47	57
	55		5		5	44	55	41	58	48	2
44	0		0		0	45	0		53	48	7
	5	44	55	44	55	45	5		48	48	12
	10		50		50	45	10		43	48	17
	15		45		45	45	15		38	48	22
	20		40		40	45	20		33	48	27
	25		35		35	45	25		28	48	32
	30		30		30	45	30		23	48	37
	35		25		25	45	35		18	48	42
	40		20		20	45	40		13	48	47
	45		15		15	45	45		8	48	52
	50		10		10	45	50		3	48	57
	55		5		5	45	55	40	59	49	1
Azimuths		15 *d.* 0'.						30 *d.* 0'.			

Horæ. / Latit.		3. 9. G.	M.	Compl. G.	M.	4. 8. G.	M.	Compl. G.	M.	5. 7. G.	M.	Compl. G.	M.
42	0	38	9	51	51	29	2	57	57	16	2	73	58
	5		4	51	56	28	58	61	2		0	74	0
	10	37	59	52	1		54	61	6		57	74	3
	15		54	52	6		50	61	10		54	74	6
	20		49	52	11		46	61	14		52	74	8
	25		44	52	16		41	61	19		49	74	11
	30		39	52	21		37	61	23		46	74	14
	35		35	52	25		33	61	27		44	74	16
	40		30	52	30		29	61	31		41	74	19
	45		25	52	35		25	61	35		38	74	22
	50		20	52	40		20	61	40		36	74	24
	55		15	52	45		16	61	44		33	74	27
43	0		10	52	50		12	61	48		31	74	29
	5		5	52	55		8	61	52		28	74	32
	10		1	52	59		4	61	56		26	74	34
	15	36	56	53	4	27	59	62	1		23	74	37
	20		51	53	9		55	62	5		20	74	40
	25		46	53	14		51	62	9		18	74	42
	30		41	53	19		47	62	13		15	74	45
	35		37	53	23		43	62	17		13	74	47
	40		32	53	28		39	62	21		10	74	50
	45		27	53	33		35	62	25		8	74	52
	50		22	53	38		31	62	29		5	74	55
	55		18	53	42		27	62	33		3	74	57
44	0		13	53	47		22	62	38		0	75	0
	5		8	53	52		18	62	42	14	58	75	2
	10		3	53	57		14	62	46		55	75	5
	15	35	58	54	2		10	62	50		53	75	7
	20		54	54	6		6	62	54		50	75	10
	25		49	54	11		2	62	58		48	75	12
	30		44	54	16	26	58	63	2		45	75	15
	35		39	54	21		54	63	6		43	75	17
	40		35	54	25		50	63	10		40	75	20
	45		30	54	30		45	63	14		38	75	22
	50		25	54	35		42	63	18		36	75	24
	55		21	54	39		38	63	22		33	75	27
Azim.		45 d. 0'.				60 d. 0'.				75 d. 0'.			

Houres		12.		1. 11.		*Compl.*		2. 10.		*Compl.*	
Latit.		G.	M.	G.	M.	G.	M.	G.	M.	G.	M.
45	0	45	0	44	6	46	0	40	54	49	6
	5	44	55	43	55	46	5		49	49	11
	10		50		50	46	10		44	49	16
	15		45		45	46	15		39	49	21
	20		40		40	46	20		34	49	26
	25		35		35	46	25		29	49	31
	30		30		30	46	30		24	49	36
	35		25		25	46	35		19	49	41
	40		20		20	46	40		14	49	46
	45		15		15	46	45		9	49	51
	50		10		10	46	50		4	49	56
	55		5		5	46	55	39	59	50	1
46	0		0		0	47	0		54	50	6
	5	43	55	42	56	47	4		49	50	11
	10		50		51	47	9		45	50	16
	15		45		46	47	14		40	50	20
	20		40		41	47	19		35	50	25
	25		35		36	47	24		30	50	30
	30		30		31	47	29		25	50	35
	35		25		26	47	34		20	50	40
	40		20		21	47	39		15	50	45
	45		15		16	47	44		10	50	50
	50		10		11	47	49		5	50	55
	55		5		6	47	54		0	51	0
47	0		0		1	47	59	38	55	51	5
	5	42	55	41	56	48	4		50	51	10
	10		50		51	48	9		46	51	14
	15		45		46	48	14		41	51	19
	20		40		41	48	19		36	51	24
	25		35		36	48	24		31	51	29
	30		30		31	48	29		26	51	34
	35		25		26	48	34		21	51	39
	40		20		21	48	39		16	51	44
	45		15		16	48	44		11	51	49
	50		10		11	48	49		7	51	53
	55		5		6	48	54		2	51	58

Azimuths 15 d. 0'. 30 d. 0'.

Heures		3.	9.	Compl.		4.	8.	Compl.		5.	7.	Compl.	
Latit.		G.	M.	G.	M.	G.	M.	G.	M.	G.	M.	G.	M.
45°	0	35	16	54	44	26	34	63	26	14	31	75	29
	5		11	54	49		30	63	30		28	75	32
	10		6	54	54		26	63	34		26	75	34
	15		2	54	58		22	63	38		23	75	37
	20	34	57	55	3		18	63	42		21	75	39
	25		52	55	8		14	63	46		19	75	41
	30		48	55	12		10	63	50		16	75	44
	35		43	55	17		6	63	54		14	75	46
	40		38	55	22		2	63	58		11	75	49
	45		34	55	26	25	58	64	2		9	75	51
	50		29	55	31		54	64	6		7	75	53
	55		24	55	36		50	64	10		4	75	56
46	0		20	55	40		46	64	14		2	75	58
	5		15	55	45		42	64	18		0	76	0
	10		10	55	50		39	64	21	13	57	76	3
	15		6	55	54		35	64	25		55	76	5
	20		1	55	59		31	64	29		53	76	7
	25	33	56	56	4		27	64	33		50	76	10
	30		52	56	8		23	64	37		48	76	12
	35		47	56	13		19	64	41		46	76	14
	40		42	56	18		15	64	45		43	76	17
	45		38	56	22		11	64	49		41	76	19
	50		33	56	27		8	64	52		39	76	21
	55		29	56	31		4	64	56		36	76	24
47	0		24	56	36		0	65	0		34	76	26
	5		19	56	41	24	56	65	4		32	76	28
	10		15	56	45		52	65	8		30	76	30
	15		10	56	50		48	65	12		27	76	33
	20		6	56	54		45	65	15		25	76	35
	25		1	56	59		41	65	19		23	76	37
	30	32	56	57	4		37	65	23		20	76	40
	35		52	57	8		33	65	27		18	76	42
	40		47	57	13		29	65	31		16	76	44
	45		43	57	17		25	65	34		14	76	46
	50		38	57	22		22	65	38		12	76	48
	55		34	57	26		18	65	42		9	76	51
Azimuths		45 d. 0'.				60 d. 0'.				75 d. 0			

Houres		12		1. 11.		*Compl.*		2. 10.		*Compl.*	
Latit.		G.	M.	G.	M.	G.	M.	G.	M.	G.	M.
48	0	42	0	41	1	48	59	37	57	52	03
	5	31	55	40	56	49	04		52	52	08
	19		50		51	49	09		47	52	13
	15		45		46	49	14		42	52	18
	20		40		41	49	19		37	52	23
	25		35		36	49	24		32	52	28
	30		30		31	49	29		28	52	32
	35		25		26	49	34		23	52	37
	40		20		21	49	39		18	52	42
	45		15		16	49	44		13	52	47
	50		10		11	49	49		8	52	52
	55		5		6	49	54		3	52	57
49	0		0		1	49	59	36	58	53	02
	5	40	55	39	56	50	04		54	53	06
	10		50		51	50	09		49	53	11
	15		45		46	50	14		44	53	16
	20		40		41	50	19		39	53	21
	25		35		36	50	24		34	53	26
	30		30		31	50	29		29	53	31
	35		25		26	50	34		24	53	35
	40		29		21	50	39		20	53	40
	45		15		16	50	44		15	53	45
	50		10		11	50	49		10	53	50
	55		5		6	50	54		5	53	55
50	0		0		1	50	58		0	54	00
	5	41	55	38	57	51	03	35	55	54	05
	10		50		52	51	08		51	54	09
	15		45		47	51	13		46	54	14
	20		40		42	51	18		41	54	19
	25		35		37	51	23		36	54	24
	30		30		32	51	28		31	54	29
	35		25		27	51	33		27	54	33
	40		20		22	51	38		22	54	38
	45		15		17	51	43		17	54	43
	50		10		12	51	48		13	54	48
	55		5		7	51	53		7	54	53
Azimuths				15 *d.* 0'.				30 *d.* 0'.			

Houres	3.	9.	Compl.		4.	8.	Compl.		5.	7.	Compl.	
Latit.	G.	M.	G.	M.	G.	M.	G.	M.	G.	M.	G.	M.
48 0	32	29	57	31	24	14	65	46	13	7	76	53
5		24	57	35		10	65	49		5	76	55
10		20	57	40		7	65	53		3	76	57
15		15	57	45		3	65	57		0	77	00
20		11	57	49	23	59	66	01	12	58	77	02
25		6	57	54		56	66	04		56	77	04
30		2	57	58		52	66	08		54	77	06
35	31	57	58	03		48	66	12		52	77	08
40		53	58	07		44	66	16		49	77	11
45		48	58	12		41	66	19		47	77	13
50		44	58	16		37	66	23		45	77	15
55		39	58	21		33	66	27		43	77	17
49 0		35	58	25		29	66	30		41	77	19
5		30	58	30		26	66	34		39	77	21
10		16	58	34		22	66	38		36	77	24
15		21	58	39		19	66	41		34	77	26
20		17	58	43		15	66	45		32	77	28
25		12	58	48		11	66	49		30	77	30
30		8	58	52		7	66	53		28	77	32
35		3	58	57		4	66	56		26	77	34
40	30	59	59	01		0	67	00		24	77	36
45		54	59	06	22	57	67	03		21	77	39
50		50	59	10		53	67	07		19	77	41
55		45	59	15		49	67	11		17	77	43
50 0		41	59	19		46	67	14		15	77	45
5		36	59	24		42	67	18		13	77	47
10		32	59	28		38	67	22		11	77	49
15		28	59	32		35	67	25		9	77	51
20		23	59	37		31	67	29		7	77	53
25		19	59	41		28	67	32		4	77	56
30		14	59	46		24	67	36		3	77	57
35		10	59	50		20	67	40		1	77	59
40		5	59	55		17	67	43	11	58	78	02
45		1	59	59		13	67	47		56	78	04
50	29	57	60	03		10	67	50		54	78	06
55		52	60	08		6	67	54		52	78	08
Azimuths		45 d. 0'.				60 d. 0'.				75 d. 0'.		

Houres		12		1. 11.		Compl.		2. 10.		Compl.	
Latit.		G.	M.	G.	M.	G.	M.	G.	M.	G.	M.
51	0	39	0	38	2	51	58	35	2	54	57
	5	38	55	37	57	52	03	34	58	55	02
	10		50		52	52	08		53	55	07
	15		45		47	52	13		48	55	12
	20		40		42	52	18		43	55	17
	25		35		37	52	23		38	55	21
	30		30		32	52	28		34	55	26
	35		25		27	52	33		29	55	31
	40		20		22	52	38		24	55	36
	45		15		17	52	43		19	55	41
	50		10		12	52	48		15	55	45
	55		5		7	52	53		10	55	50
52	0		0		2	52	58		5	55	55
	5	37	55	36	57	53	03		0	56	00
	10		50		53	53	07	33	55	56	05
	15		45		48	53	12		51	56	09
	20		40		43	53	17		46	56	14
	25		35		38	53	22		41	56	19
	30		30		33	53	27		36	56	24
	35		25		28	53	32		32	56	28
	40		20		23	53	37		27	56	33
	45		15		18	53	42		22	56	38
	50		10		13	53	47		17	56	43
	55		5		8	53	52		12	56	48
53	0		0		3	53	57		8	56	52
	5	36	55	35	58	54	02		3	56	57
	10		50		53	54	07	32	58	57	02
	15		45		48	54	12		53	57	07
	20		40		43	54	17		49	57	11
	25		35		38	54	22		44	57	16
	30		30		33	54	27		39	57	21
	35		25		28	54	32		34	57	26
	40		20		23	54	37		30	57	30
	45		15		18	54	42		25	57	35
	50		10		14	54	46		20	57	40
	55		5		9	54	51		15	57	45
Azimuths				15 d. 0'.				30 d. 0'.			

Houres		3.	9.	Compl.		4.	8.	Compl.		5.	7.	Compl.	
Latit.		G.	M.	G.	M.	G.	M.	G.	M.	G.	M.	G.	M.
51	0	29	48	60	12	22	36	67	57	11	50	78	10
	5		43	60	17	21	59	68	01		48	78	12
	10		39	60	21		55	68	05		46	78	14
	15		35	60	25		52	68	08		44	78	16
	20		30	60	30		48	68	12		42	78	18
	25		26	60	34		45	68	15		40	78	20
	30		21	60	39		41	68	19		38	78	22
	35		17	60	43		38	68	22		36	78	24
	40		13	60	47		34	68	26		34	78	26
	45		8	60	52		31	68	29		32	78	28
	50		4	60	56		27	68	33		30	78	30
	55	28	59	61	01		24	68	36		28	78	32
52	0		55	61	05		20	68	40		26	78	34
	5		51	61	09		17	68	43		24	78	36
	10		46	61	14		13	68	47		22	78	38
	15		42	61	18		10	68	50		20	78	40
	20		38	61	22		6	68	54		18	78	42
	25		33	61	27		3	68	57		16	78	44
	30		29	61	31	20	59	69	01		14	78	46
	35		25	61	35		56	69	04		12	78	48
	40		20	61	40		52	69	07		10	78	50
	45		16	61	44		49	69	11		8	78	52
	50		12	61	48		46	69	14		6	78	54
	55		7	61	53		42	69	18		4	78	56
53	0		3	61	57		39	69	21		2	78	58
	5	27	59	62	01		35	69	25		0	79	00
	10		55	62	05		32	69	28	10	58	79	02
	15		50	62	10		28	69	32		56	79	04
	20		46	62	14		25	69	35		54	79	06
	25		41	62	18		22	69	38		52	79	08
	30		37	62	23		18	69	42		50	79	09
	35		33	62	27		15	69	45		49	79	11
	40		29	62	31		11	69	49		47	79	13
	45		24	62	36		8	69	52		45	79	15
	50		20	62	40		5	69	55		43	79	17
	55		16	62	44		1	69	59		41	79	19
Azimuths						16d.0'.				16d.0'.			

Houres		12		1. 11.		Compl.		2. 10.		Compl.	
Latit.		G.	M.	G.	M.	G.	M.	G.	M.	G.	M.
54	0	36	0	35	4	54	56	32	11	57	49
	5	35	55	34	59	55	01		6	57	54
	10		50		54	55	06		1	57	59
	15		45		49	55	11	31	57	58	3
	20		40		44	55	16		52	58	8
	25		35		39	55	21		47	58	13
	30		30		34	55	26		42	58	18
	35		25		29	55	31		38	58	22
	40		20		24	55	36		33	58	27
	45		15		19	55	41		28	58	32
	50		10		14	55	46		23	58	37
	55		5		9	55	51		19	58	41
55	0		0		4	55	56		14	58	46
	5	34	55	33	59	56	1		9	58	51
	10		50		54	56	6		5	58	55
	15		45		50	56	10		0	59	0
	20		40		45	56	15	30	55	59	5
	25		35		40	56	20		50	59	10
	30		30		35	56	25		46	59	14
	35		25		30	56	30		41	59	19
	40		20		25	56	35		36	59	24
	45		15		20	56	40		32	59	28
	50		10		15	56	45		27	59	33
	55		5		10	56	50		22	59	38
56	0		0		5	56	55		17	59	43
	5	33	55		0	57	0		13	59	44
	10		50	32	55	57	5		8	59	52
	15		45		50	57	10		3	59	57
	20		40		45	57	15	29	59	60	1
	25		35		40	57	20		54	60	6
	30		30		36	57	24		49	60	11
	35		25		31	57	29		45	60	15
	40		20		26	57	34		40	60	20
	45		15		21	57	39		35	60	25
	50		10		16	57	44		31	60	29
	55		5		11	57	49		26	60	34
Azimuths				15 *d.* 0'.				30 *d.* 0'.			

Houres		3.	9.	Compl.		4.	8.	Compl.		5.	7.	Compl.	
Latit.		G.	M.	G.	M.	G.	M.	G.	M.	G.	M.	G.	M.
54	0	27	12	62	48	19	58	70	2	10	39	79	21
	5		7	62	53		54	70	6		37	79	13
	10		3	62	57		51	70	9		35	79	25
	15	26	59	63	1		48	70	12		33	79	27
	20		54	63	6		44	70	16		31	79	29
	25		50	63	10		41	70	19		29	79	31
	30		46	63	14		38	70	22		28	79	32
	35		42	63	18		34	70	26		26	79	34
	40		37	63	23		31	70	29		24	79	36
	45		33	63	27		28	70	32		22	79	38
	50		29	63	31		24	70	36		20	79	40
	55		25	63	35		21	70	39		18	79	42
55	0		20	63	40		18	70	42		16	79	44
	5		16	63	44		14	70	46		14	79	46
	10		12	63	48		11	70	49		13	79	47
	15		8	63	52		8	70	52		11	79	49
	20		4	63	56		4	70	56		9	99	51
	25	25	59	64	1		1	70	59		7	79	53
	30		55	64	5	18	58	71	2		5	79	55
	35		51	64	9		55	71	5		3	79	57
	40		47	64	13		51	71	9		1	79	59
	45		43	64	17		48	71	12		0	79	0
	50		38	64	22		45	71	15	9	58	80	2
	55		34	64	26		41	71	19		56	80	4
56	0		30	64	30		38	71	22		54	80	6
	5		26	64	34		35	71	25		52	80	8
	10		22	64	38		32	71	28		50	80	10
	15		17	64	43		28	71	32		49	80	11
	20		13	64	47		25	71	35		47	80	13
	25		9	64	51		22	71	38		45	80	15
	30		5	64	55		19	71	41		43	80	17
	35		1	64	59		15	71	45		41	80	19
	40	24	57	65	3		12	71	48		40	80	20
	45		52	65	8		9	71	51		38	80	22
	50		48	65	12		6	71	54		36	80	24
	55		44	65	16		3	71	57		34	80	26
Azimuths		45 d. 0'.				60 d. 0'.				75 d. 0'.			

Houres		12		1. 11.		Compl.		2. 10.		Compl.	
Latit.		G.	M.	G.	M.	G.	M.	G.	M.	G.	M.
57	0	33	0	32	6	57	54	29	21	60	39
	5	32	55		1	57	59		17	60	43
	10		50	31	56	58	4		12	60	48
	15		45		51	58	9		7	60	53
	20		40		46	58	14		3	60	57
	25		35		46	58	19	28	58	61	2
	30		30		36	58	24		53	61	7
	35		25		31	58	29		49	61	11
	40		20		27	58	33		44	61	16
	45		15		22	58	38		39	61	21
	50		10		17	58	43		35	61	25
	55		5		12	58	48		30	61	30
58	0		0		7	58	53		25	61	35
	5	31	55		2	58	58		21	61	39
	10		50	30	57	59	3		16	61	44
	15		45		52	59	8		11	61	49
	20		40		47	59	13		7	61	53
	25		35		42	59	18		2	61	58
	30		30		37	59	23	27	57	62	3
	35		25		32	59	28		53	62	7
	40		20		27	59	33		48	62	12
	45		15		23	59	37		43	62	17
	50		10		18	59	42		39	62	21
	55		5		13	59	47		34	62	26
59	0		0		8	59	52		29	62	31
	5	30	55		2	59	57		25	62	35
	10		50	29	58	60	2		20	62	40
	15		45		53	60	7		16	62	44
	20		40		48	60	12		11	62	49
	25		35		43	60	17		6	62	54
	30		30		38	60	22		2	62	58
	35		25		33	60	27	26	57	63	3
	40		20		28	60	32		53	63	7
	45		15		24	60	36		48	63	12
	50		10		19	60	41		43	63	17
	55		5		14	60	46		38	63	22
Azimuths				15 d. 0'.				30 d. 0'.			

Horae		3.	9.	Compl.		4.	8.	Compl.		5.	7.	Compl.	
Latit.		G.	M.	G.	M.	G.	M.	G.	M.	G.	M.	G.	M.
57	0	24	40	65	20	17	59	72	1	9	32	80	28
	5		36	65	24		56	72	4		31	80	29
	10		32	65	28		53	72	7		29	80	31
	15		27	65	33		50	72	10		27	80	33
	20		23	65	37		47	72	13		25	80	35
	25		19	65	41		43	72	17		24	80	36
	30		15	65	45		40	72	20		22	80	38
	35		11	65	49		37	72	23		20	80	40
	40		7	65	53		34	72	26		18	80	42
	45		3	65	57		31	72	29		16	80	44
	50	23	59	66	1		27	72	33		15	80	45
	55		54	66	6		24	72	36		13	80	47
58	0		50	66	10		21	72	39		11	80	49
	5		46	66	14		18	72	42		9	80	51
	10		42	66	18		15	72	45		8	80	52
	15		38	66	22		12	72	48		6	80	54
	20		34	66	26		8	72	52		4	80	56
	25		30	66	30		5	72	55		2	80	58
	30		26	66	34		2	72	58		1	80	59
	35		22	66	38		0	73	0	8	59	80	1
	40		17	66	43	16	56	73	4		57	80	3
	45		13	66	47		53	73	7		56	81	4
	50		9	66	51		50	73	10		54	81	6
	55		5	66	55		46	73	14		52	81	8
59	0		1	66	59		43	73	17		50	81	10
	5	22	57	67	3		40	73	20		49	81	11
	10		53	67	7		37	73	23		47	81	13
	15		49	67	11		34	73	26		45	81	15
	20		45	67	15		31	73	29		43	81	17
	25		41	67	19		28	73	32		42	81	18
	30		37	67	23		25	73	35		40	81	20
	35		33	67	27		22	73	38		38	81	22
	40		2[illegible]	67	31		18	73	42		37	81	23
	45		25	67	35		15	73	45		35	81	25
	50		21	67	39		12	73	48		33	81	27
	55		16	67	44		9	73	51		32	81	28
Azimuths		45 d. 0'.				60 d. 0'.				75 d. 0'.			

Houres Latit.		12.		1. 11.		Compl.		2. 10.		Compl.	
		G.	M.	G.	M.	G.	M.	G.	M.	G.	M.
60	0		0	29	9	60	51	26	34	63	26
	5	29	55		4	60	56		29	63	31
	10		50	28	59	61	1		25	63	35
	15		45		54	61	6		20	63	40
	20		40		49	61	11		15	63	45
	25		35		44	61	16		11	63	49
	30		30		39	61	21		6	63	54
	35		25		34	61	26		2	63	58
	40		20		30	61	30	25	57	64	3
	45		15		25	61	35		52	64	8
	50		10		20	61	40		48	64	12
	55		5		15	61	45		43	64	17
61	0		0		10	61	50		39	64	21
	5	28	55		5	61	55		34	64	26
	10		50		0	61	0		29	64	31
	15		45	27	55	62	5		25	64	35
	20		40		50	62	10		20	64	40
	25		35		45	62	15		16	64	44
	30		30		40	62	20		11	64	49
	35		25		36	62	24		6	64	54
	40		20		31	62	29		2	64	58
	45		15		26	62	34	24	57	65	3
	50		10		21	62	39		53	65	7
	55		5		16	62	44		48	65	12
62	0		0		11	62	49		43	65	17
	5	29	55		6	62	54		39	65	21
	10		50		1	62	59		34	65	26
	15		45	26	56	63	4		30	65	30
	20		40		51	63	9		25	65	35
	25		35		47	63	13		21	65	40
	30		30		42	63	18		16	65	44
	35		25		37	63	23		11	65	49
	40		20		32	63	28		7	65	53
	45		15		27	63	33		2	65	58
	50		10		22	63	38	23	58	66	2
	55		5		17	63	43		53	66	7
Azimuths				15 *d*.0'.				30 *d*.0'.			

Houres	3.	9.	Compl.		4.	8.	Compl.		5.	7.	Compl.	
Latit.	G.	M.	G.	M.	G.	M.	G.	M.	G.	M.	G.	M.
60 0	22	12	67	47	16	6	73	54	8	30	81	30
5		8	67	52		3	73	57		28	81	32
10		4	67	56		0	74	0		27	81	33
15		0	68	0	15	57	74	3		25	81	35
20	21	56	68	4		54	74	6		23	81	37
25		52	68	8		51	74	9		21	81	39
30		48	68	12		48	74	12		20	81	42
35		44	68	16		45	74	15		18	81	44
40		40	68	20		42	74	18		16	81	40
45		36	68	24		39	74	21		15	81	45
50		32	68	28		36	74	24		13	81	47
55		28	68	32		32	74	28		12	81	48
61 0		24	68	36		29	74	31		10	81	50
5		20	68	40		26	74	34		8	81	52
10		16	68	44		23	74	37		7	81	53
15		12	68	48		20	74	40		5	81	55
20		8	68	52		17	74	43		3	81	57
25		4	68	56		14	74	46		2	81	58
30		0	69	0		11	74	49		0	82	0
35	20	56	69	4		8	74	52	7	58	82	2
40		52	69	8		5	74	55		57	82	3
45		48	69	12		2	74	58		55	82	5
50		44	69	16	14	59	75	1		53	82	7
55		40	69	20		56	75	4		52	82	8
62 0		36	69	24		53	75	7		50	82	10
5		32	69	28		50	75	10		49	82	11
10		28	69	32		47	75	13		47	82	13
15		24	69	36		44	75	16		45	82	15
20		20	69	40		41	75	19		44	82	16
25		16	69	44		38	75	22		42	82	18
30		12	69	48		35	75	25		40	82	20
35		9	69	51		32	75	28		39	82	21
40		5	69	55		29	75	31		37	82	23
45		1	69	59		26	75	34		36	82	24
50	19	57	70	3		23	75	37		34	82	26
55		53	70	7		21	75	39		32	82	28

Azimuths. 45 d.0'. 60 d.0'. 75 d.0'.

Houres		12.		1. 11.		Compl.		2. 10.		Compl.	
Latit.		G.	M.	G.	M.	G.	M.	G.	M.	G.	M.
63	0	27	0	26	12	63	48	23	49	66	11
	5	26	55		7	63	53		44	66	16
	10		50		2	63	58		39	66	21
	15		45	25	58	64	2		35	66	25
	20		40		53	64	7		30	66	30
	25		35		48	64	12		26	66	34
	30		30		43	64	17		21	66	39
	35		25		38	64	22		17	66	43
	40		20		33	64	27		12	66	48
	45		15		28	64	32		8	66	52
	50		10		23	64	37		3	66	57
	55		5		18	64	42	22	58	67	2
64	0		0		14	64	46		54	67	6
	5	25	55		9	64	51		49	67	11
	10		50		4	64	56		45	67	15
	15		45	24	59	65	1		40	67	20
	20		40		54	65	6		36	67	24
	25		35		49	65	11		31	67	29
	30		30		44	65	16		27	67	33
	35		25		39	65	21		22	67	38
	40		20		34	65	26		18	67	42
	45		15		30	65	30		13	67	47
	50		10		25	65	35		9	67	51
	55		5		20	65	40		4	67	56
65	0		0		15	65	45	21	59	68	1
	5	24	55		10	65	50		55	68	5
	10		50		5	65	55		50	68	10
	15		45		0	66	0		46	68	14
	20		40	23	55	66	5		41	68	19
	25		35		50	66	10		37	68	23
	30		30		46	66	14		32	68	28
	35		25		41	66	19		28	68	32
	40		20		36	66	24		23	68	37
	45		15		31	66	29		19	68	41
	50		10		26	66	34		14	68	46
	55		5		21	66	39		10	68	50
Azimuths				15 *d.* 0′.				30 *d.* 0′.			

Houres	3.	9.	Compl.		4.	8.	Compl.		5.	7.	Compl.	
Latit.	G.	M.	G.	M.	G.	M.	G.	M.	G.	M.	G.	M.
63 0	19	49	70	11	14	18	75	42	7	31	82	29
5		45	70	15		15	75	45		29	82	31
10		41	70	19		12	75	48		28	82	32
15		37	70	23		9	75	51		26	82	34
20		33	70	27		6	75	54		24	82	36
25		29	70	31		3	75	57		23	82	37
30		25	70	35		0	76	0		21	82	39
35		21	70	39	13	57	76	3		20	82	40
40		17	70	43		54	76	6		18	82	42
45		13	70	47		51	76	9		16	82	44
50		10	70	50		48	76	12		15	82	45
55		6	70	54		45	76	15		13	82	47
64 0		2	70	58		42	76	18		12	82	48
5	18	58	71	2		39	76	21		10	82	50
10		54	71	6		36	76	24		9	82	51
15		50	71	10		34	76	26		7	82	53
20		46	71	14		31	76	29		5	82	55
25		42	71	18		28	76	32		4	82	56
30		38	71	22		25	76	35		2	82	58
35		34	71	26		22	76	38		1	2	59
40		30	71	30		19	76	41	6	59	83	1
45		27	71	33		16	76	44		58	83	2
50		23	71	37		13	76	47		56	83	4
55		19	71	41		10	76	50		54	83	6
65 0		15	71	45		7	76	53		53	83	7
5		11	71	49		5	76	55		51	83	9
10		07	71	53		2	76	58		50	83	10
15		3	71	57	12	59	77	1		48	83	12
20	17	59	72	1		56	77	4		47	83	13
25		56	72	5		53	77	7		45	83	15
30		52	72	8		50	77	10		44	83	16
35		48	72	12		47	77	13		42	83	18
40		44	72	16		44	77	16		41	83	19
45		40	72	20		42	77	18		39	83	21
50		36	72	24		39	77	21		37	83	23
55		32	72	28		37	77	23		36	83	24
Azimuths. 45 *d.* 0'.							60 *d.* 0'.				75 *d.* 0'.	

Houres		12		1. 11.		Compl.		2. 10.		Compl.	
Latit.		G.	M.	G.	M.	G.	M.	G.	M.	G.	M.
66	0	24	0	23	16	66	44	21	5	68	54
	5	23	55		11	66	49		1	68	59
	10		50		6	66	54	20	56	69	4
	15		45		2	66	58		52	69	8
	20		40	22	57	67	3		47	69	13
	25		35		52	67	8		43	69	17
	30		30		47	67	13		38	69	22
	35		25		42	67	18		34	69	26
	40		20		37	67	23		29	69	31
	45		15		32	67	28		25	69	35
	50		10		27	67	33		20	69	40
	55		5		23	67	37		16	69	44
67	0		0		18	67	42		11	69	49
	5	22	55		13	67	47		7	69	53
	10		50		8	67	52		2	69	58
	15		45		3	67	57	19	58	70	2
	20		40	21	58	68	2		53	70	7
	25		35		53	68	7		49	70	11
	30		30		48	68	12		44	70	16
	35		25		43	68	17		40	70	20
	40		20		39	68	21		35	70	25
	45		15		34	68	26		31	70	29
	50		10		29	68	31		26	70	34
	55		5		24	68	36		22	70	38
68	0		0		19	68	41		17	70	43
	5	21	55		14	68	46		13	70	47
	10		50		9	68	51		8	70	52
	15		45		4	68	56		4	70	56
	20		40		0	69	0	18	59	71	1
	25		35	20	55	69	5		55	71	5
	30		30		50	69	10		50	71	10
	35		25		45	69	15		46	71	14
	40		20		40	69	20		41	71	19
	45		15		35	69	25		37	71	23
	50		10		30	69	30		32	71	28
	55		5		25	69	35		28	71	32
Azimuths				15 d. 0'.				30 d. 0'.			

Houres.		3.	9.	Compl.		4.	8.	Compl.		5.	7.	Compl.	
Latit.		G.	M.	G.	M.	G.	M.	G.	M.	G.	M.	G.	M.
66	0	17	29	72	31	12	33	77	27	6	34	83	26
	5		25	72	35		30	77	30		33	83	27
	10		21	72	39		27	77	33		31	83	29
	15		17	72	43		24	77	36		30	83	30
	20		13	72	47		22	77	38		28	83	32
	25		9	72	51		19	77	41		27	83	33
	30		5	72	55		16	77	44		25	83	35
	35		2	72	58		13	77	47		24	83	36
	40	16	58	73	2		10	77	50		22	83	38
	45		54	73	6		7	77	53		21	83	39
	50		50	73	10		5	77	55		19	83	41
	55		46	73	14		2	77	58		18	83	42
67	0		42	73	18	11	59	78	1		16	83	44
	5		39	73	21		56	78	4		15	83	45
	10		35	73	25		53	78	7		13	83	47
	15		31	73	29		50	78	10		12	83	48
	20		27	73	33		48	78	12		10	83	50
	25		23	73	37		45	78	15		9	83	51
	30		19	73	41		42	78	18		7	83	53
	35		16	73	44		39	78	21		6	83	54
	40		12	73	48		36	78	24		4	83	56
	45		8	73	52		34	78	26		3	83	57
	50		4	73	56		31	78	29		1	83	59
	55		0	74	0		28	78	32		0	84	0
68	0	15	57	74	3		25	78	35	5	58	84	2
	5		53	74	7		22	78	38		57	84	3
	10		49	74	11		20	78	40		55	84	5
	15		45	74	15		17	78	43		54	84	6
	20		41	74	19		14	78	46		52	84	8
	25		38	74	22		11	78	49		51	84	9
	30		34	74	26		9	78	51		49	84	11
	35		30	74	30		6	78	54		48	84	12
	40		26	74	34		3	78	57		46	84	14
	45		22	74	38		0	79	0		45	84	15
	50		19	74	41	10	57	79	3		43	84	17
	55		15	74	45		55	79	5		42	84	18
Azimuths		45 d. 0'.				60 d. 0'.				75 d. 0'.			

Houres		12		1. 11.		Compl.		2. 10.		Compl.	
Latit.		G.	M.	G.	M.	G.	M.	G.	M.	G.	M.
69	0	21	0	20	21	69	39	18	23	71	37
	5	20	55		16	69	44		19	71	41
	10		50		11	69	49		14	71	46
	15		45		6	69	54		10	71	50
	20		40		1	69	59		5	71	55
	25		35	19	56	70	4		2	71	58
	30		30		51	70	9	17	57	72	3
	35		25		47	70	13		52	72	8
	40		20		42	70	18		48	72	12
	45		15		37	70	23		43	72	17
	50		10		32	70	28		39	72	21
	55		5		27	70	33		34	72	26
70	0		0		22	70	38		30	72	30
	5	19	55		17	70	43		25	72	35
	10		50		12	70	48		21	72	39
	15		45		8	70	52		16	72	44
	20		40		3	70	57		12	72	48
	25		35	18	58	71	2		7	72	53
	30		30		53	71	7		3	72	57
	35		25		47	71	13	16	59	73	1
	40		20		42	71	18		54	73	6
	45		15		38	71	22		50	73	10
	50		10		34	71	26		45	73	15
	55		5		29	71	31		41	73	19
71	0		0		24	71	36		36	73	24
	5	18	55		19	71	41		32	73	28
	10		50		14	71	46		27	73	33
	15		45		9	71	51		23	73	37
	20		40		4	71	56		18	73	42
	25		35	17	59	72	1		14	73	46
	30		30		55	72	5		10	73	50
	35		25		50	72	10		5	73	55
	40		20		45	72	15		1	73	59
	45		15		41	72	19	15	56	74	4
	50		10		35	71	25		52	74	8
	55		5		30	72	30		47	74	12
Azimuths				15 d. 0'.				30 d. 0'.			

Houres.		3.	9.	Compl.		4.	8.	Compl.		5.	7.	Compl.	
Latit.		G.	M.	G.	M.	G.	M.	G.	M.	G.	M.	G.	M.
69	0	15	11	74	49	10	52	79	8	5	40	84	20
	5		7	74	53		49	79	11		39	84	21
	10		4	74	56		46	79	14		37	84	23
	15		0	75	0		44	79	16		36	84	24
	20	14	56	75	4		41	79	19		35	84	25
	25		52	75	8		38	79	22		33	84	27
	30		49	75	11		35	79	25		32	84	28
	35		45	75	15		33	79	27		30	84	30
	40		41	75	19		30	79	30		29	84	31
	45		37	75	23		27	79	33		27	84	33
	50		33	75	27		24	79	36		26	84	34
	55		30	75	30		22	79	38		24	84	36
70	0		26	75	34		19	79	41		23	84	37
	5		22	75	38		16	79	44		21	84	39
	10		18	75	42		13	79	47		20	84	40
	15		15	75	45		11	79	49		19	84	41
	20		11	75	49		8	79	52		17	84	43
	25		7	75	53		5	79	55		16	84	44
	30		3	75	56		3	79	57		14	84	46
	35		0	76	0		0	80	0		13	84	47
	40	13	56	76	4	9	57	80	3		11	84	49
	45		52	76	8		54	80	6		10	84	50
	50		48	76	12		52	80	8		8	84	52
	55		45	76	15		49	80	11		7	84	53
71	0		41	76	19		46	80	14		6	84	54
	5		37	76	23		43	80	17		4	84	56
	10		34	76	26		41	80	19		3	84	57
	15		30	76	30		38	80	22		1	84	59
	20		26	76	34		35	80	25		0	85	0
	25		22	76	38		33	80	27	4	58	85	2
	30		19	76	41		30	80	30		57	85	3
	35		15	76	45		27	80	33		56	85	4
	40		11	76	49		24	80	36		54	85	6
	45		7	76	53		22	80	38		53	85	7
	50		4	76	56		19	80	41		51	85	9
	55		0	77	0		16	80	44		50	85	10
Azimuths		45 *d*. 0'.				60 *d*. 0'.				75 *d*. 0'.			

Houres Latit.		12.		1. 11.		Compl.		2. 10.		Compl.	
G.	M.	G.	M.	G.	M.	G.	M.	G.	M.	G.	M.
72	0	18	0	17	25	72	35	15	43	74	17
	5	17	55		20		40		38		22
	10		50		16		44		34		26
	15		45		11		49		29		31
	20		40		6		54		25		35
	25		35		1		59		20		40
	30		30	16	56	73	4		16		44
	35		25		51		9		11		49
	40		20		47		13		7		53
	45		15		42		18		3		57
	50		10		37		23	14	59	57	1
	55		5		32		28		54		6
73	0		0		27		33		50		10
	5	16	55		22		38		45		15
	10		50		17		43		41		19
	15		45		12		48		36		24
	20		40		8		52		32		28
	25		35		3		57		27		33
	30		30	15	58	74	2		23		37
	35		25		53		7		18		42
	40		20		48		12		14		46
	45		15		43		17		10		50
	50		10		39		21		6		54
	55		5		34		26		1		59
74	0		0		29		31	13	57	76	3
	5	15	55		24		36		52		8
	10		50		19		41		48		12
	15		45		14		46		43		17
	20		40		9		51		39		21
	25		35		4		56		34		26
	30		30		0	75	0		30		30
	35		25	14	55		5		25		35
	40		20		50		10		21		39
	45		15		45		15		17		43
	50		10		40		20		13		47
	55		5		35		25		8		52

Azimuths ---------- 15 d. 0'. ---------- 30 d. 0'.

Houres		3. 9.		Compl.		4. 8.		Compl.		5. 7.		Compl.	
Latit.		G.	M.	G.	M.	G.	M.	G.	M.	G.	M.	G.	M.
72	0	12	56	77	4	9	14	80	46	4	48	85	12
	5		52		8		11		49		47		13
	10		49		11		8		52		46		14
	15		45		15		5		55		45		15
	20		42		18		3		57		43		17
	25		38		22		1		59		42		18
	30		34		26	8	58	81	2		40		20
	35		30		30		55		5		39		21
	40		27		33		52		8		37		23
	45		23		37		49		11		36		24
	50		19		41		47		13		34		26
	55		15		45		44		16		33		27
73	0		12		48		41		19		31		29
	5		8		52		38		22		30		30
	10		5		55		36		24		29		31
	15		1		59		33		27		28		32
	20	11	57	78	3		31		29		26		34
	25		53		7		28		32		25		35
	30		50		10		26		34		23		37
	35		46		14		23		37		22		38
	40		42		18		20		40		20		40
	45		38		22		17		43		19		41
	50		35		25		15		45		17		43
	55		31		29		12		48		16		44
74	0		28		32		10		50		15		45
	5		24		36		7		53		14		46
	10		20		40		4		56		12		48
	15		16		44		1		59		11		49
	20		13		47	7	59	82	1		9		51
	25		9		51		56		4		8		52
	30		6		54		54		6		6		54
	35		2		58		51		9		5		55
	40	10	58	79	2		48		12		4		56
	45		54		6		45		15		3		57
	50		51		9		43		17		1		59
	55		47		13		40		20		0	86	0
Azimuths		45 d. 0'.				60 d. 0'.				75 d. 0'.			

Houres Latit.		12. G.	M.	1. 11. G.	M.	Compl. G.	M.	2. 10. G.	M.	Compl. G.	M.
75	0		0	14	31	75	29	13	4	76	56
	5	14	55		26		34	12	59	77	1
	10		50		21		39		55		5
	15		45		16		44		50		10
	20		40		11		49		46		14
	25		35		6		54		41		19
	30		30		2		58		37		23
	35		25	13	57	76	3		33		27
	40		20		52		8		29		31
	45		15		47		13		24		36
	50		10		42		18		20		40
	55		5		37		23		15		45
76	0		0		32		28		11		49
	5	13	55		27		33		6		54
	10		50		23		37		2		58
	15		45		18		42	11	58	78	2
	20		40		13		47		54		6
	25		35		8		52		49		11
	30		30		3		57		45		15
	35		25	12	58	77	2		40		20
	40		20		54		6		36		24
	45		15		49		11		31		29
	50		10		44		16		27		33
	55		5		39		21		22		38
77	0		0		34		26		18		42
	5	12	55		29		31		14		46
	10		50		25		35		10		50
	15		45		20		40		5		55
	20		40		15		45		1		59
	25		35		10		50	10	56	79	4
	30		30		5		55		52		8
	35		25		00		0		47		13
	40		20	11	56	78	4		43		17
	45		15		51		9		39		21
	50		10		46		14		35		25
	55		5		41		19		30		30
Azimuths					15 *d.* 0′.				30 *d.* 0′.		

Houres		3.	9.	*Compl.*		4.	8.	*Compl.*		5.	7.	*Compl.*	
Latit.		G.	M.	G.	M.	G.	M.	G.	M.	G.	M.	G.	M.
75	0	10	44	79	16	7	38	82	22	3	58	86	2
	5		40		20		35		25		57		3
	10		36		24		33		27		55		5
	15		32		28		30		30		54		6
	20		29		31		27		33		53		7
	25		25		35		24		36		52		8
	30		22		38		22		38		50		10
	35		18		42		19		41		49		11
	40		14		46		17		43		47		13
	45		10		50		14		46		46		14
	50		7		53		12		48		44		16
	55		3		57		9		51		43		17
76	0		0	80	0		6		54		42		18
	5	9	56		4		3		57		41		19
	10		53		7		1		59		39		21
	15		49		11	6	58	83	2		38		22
	20		45		15		56		4		36		24
	25		41		19		53		7		35		25
	30		38		22		51		9		33		27
	35		34		26		48		12		32		28
	40		31		29		45		15		31		29
	45		27		33		42		18		30		30
	50		24		36		40		20		28		32
	55		20		40		37		23		27		33
77	0		16		44		35		25		25		35
	5		12		48		32		28		24		36
	10		9		51		30		30		22		37
	15		5		55		27		33		21		39
	20		2		58		25		35		20		40
	25	8	58	81	2		22		38		19		41
	30		55		5		20		40		17		43
	35		51		9		17		43		16		44
	40		47		13		14		46		14		46
	45		43		17		11		49		13		47
	50		40		20		9		51		12		48
	55		36		24		6		54		11		49
Azimuths		45 *d.* 0'.				60 *d.* 0'.				75 *d.* 0'.			

Houres		12.		1. 11.		*Compl.*		2. 10.		*Compl.*	
Latit.		G.	M.	G.	M.	G.	M.	G.	M.	G.	M.
78	0	12	0	11	36	78	24	10	26	79	34
	5	11	55		31		29		21		39
	10		50		26		34		14		43
	15		45		21		39		12		48
	20		40		17		43		08		52
	25		35		12		48		4		56
	30		30		7		53		0	80	0
	35		25		2		58	9	55		5
	40		20	10	57	79	3		51		9
	45		15		52		8		46		14
	50		10		48		12		42		18
	55		5		43		17		37		23
79	0		0		38		22		33		27
	5	10	55		33		27		29		31
	10		50		28		32		25		35
	15		45		23		37		20		40
	20		40		19		41		16		46
	25		35		14		46		11		49
	30		30		9		51		7		53
	35		25		4		56		2		58
	40		20	9	59	80	1	8	58	81	2
	45		15		54		6		54		6
	50		10		50		10		50		10
	55		5		45		15		45		15
80	0		0		40		20		41		19
	5	9	55		35		25		36		24
	10		50		30		30		32		28
	15		45		25		35		27		33
	20		40		21		39		23		37
	25		35		16		44		19		41
	30		30		11		49		15		45
	35		25		6		54		10		50
	40		20		1		59		6		54
	45		15	8	56	81	4		1		59
	50		10		52		8	7	57	82	3
	55		5		47		13		53		7
Azimuths				15 *d.* 0'.				30 *d.* 0'.			

Houres	3.	9.	Compl.		4.	8.	Compl.		5.	7.	Compl.	
Latit.	G.	M.	G.	M.	G.	M.	G.	M.	G.	M.	G.	M.
78 0	8	33	81	27	6	4	83	56	3	9	86	51
5		29		31		1		59		7		53
10		26		34	5	59	84	1		6		54
15		22		38		56		4		5		55
20		18		42		54		6		4		56
25		14		46		51		9		2		58
30		11		49		49		11		1		59
35		7		53		46		14	2	59	87	1
40		4		56		43		17		58		2
45		0	82	0		40		20		56		4
50	7	57		3		38		22		55		5
55		53		7		35		25		54		6
79 0		50		10		33		27		53		7
5		46		14		30		30		52		8
10		42		18		28		32		51		9
15		38		22		25		35		49		11
20		35		25		23		37		48		12
25		31		29		20		40		46		14
30		28		32		18		42		45		15
35		24		36		15		45		43		17
40		21		39		13		47		42		18
45		17		43		10		50		40		20
50		14		46		7		53		39		21
55		10		50		4		56		38		22
80 0		6		54		2		58		37		23
5		2		58	4	59	85	1		35		25
10	6	59	83	1		57		3		34		26
15		55		5		54		6		32		28
20		52		8		52		8		31		29
25		49		11		49		11		30		30
30		46		14		47		13		29		31
35		42		18		44		16		27		33
40		38		22		42		18		26		34
45		34		26		39		21		24		36
50		31		29		37		23		23		37
55		27		33		34		26		22		38
Azimuths	45 d. 0'				60 d. 0'.				75 d. 0'.			

Houres		12		1. 11.		Compl.		2. 10.		Compl.	
Latit.		G.	M.	G.	M.	G.	M.	G.	M.	G.	M.
81	0	9	0	8	42	81	18	7	49	82	11
	5	8	55		37		23		44		16
	10		50		32		28		40		20
	15		45		27		33		35		25
	20		40		23		37		31		29
	25		35		18		42		26		34
	30		30		13		47		22		38
	35		25		8		52		18		42
	40		20		3		57		14		46
	45		15	7	58	82	2		9		51
	50		10		54		6		5		55
	55		5		49		11		0	83	0
82	0		0		44		16	6	56		4
	5	7	55		39		21		52		8
	10		50		34		26		48		12
	15		45		29		31		43		17
	20		40		25		35		39		21
	25		35		20		40		34		26
	30		30		15		45		30		30
	35		25		10		50		26		34
	40		20		5		55		22		38
	45		15		0	83	0		17		43
	50		10	6	56		4		13		47
	55		5		51		9		8		52
83	0		0		46		14		4		56
	5	6	55		41		19	5	59	84	1
	10		50		36		24		55		5
	15		45		31		29		51		9
	20		40		26		34		47		13
	25		35		21		39		42		18
	30		30		17		43		38		22
	35		25		12		48		33		27
	40		20		7		53		29		31
	45		15		2		58		25		35
	50		10	5	57	84	3		21		39
	55		5		52		8		16		44
Azimuths				15 d. 0'.				30 d. 0'.			

Houres		3.	9.	Compl.		4.	8.	Compl.		5.	7.	Compl.	
Latit.		G.	M.	G.	M.	G.	M.	G.	M.	G.	M.	G.	M.
81	0	6	23	83	37	4	32	85	28	2	21	87	39
	5		19		41		29		31		19		41
	10		16		44		27		33		18		42
	15		12		48		24		36		17		43
	20		9		51		21		39		16		44
	25		5		55		18		42		14		46
	30		2		58		16		44		13		47
	35	5	58	84	2		13		47		11		49
	40		55		5		11		49		10		50
	45		51		9		8		52		9		51
	50		48		12		6		54		8		52
	55		44		16		3		57		6		53
82	0		41		19		1		59		5		55
	5		37		23	3	58	86	2		3		57
	10		33		27		56		4		2		58
	15		29		31		53		7		1		59
	20		26		34		51		9		0	88	0
	25		22		38		48		12	1	58		2
	30		19		41		46		14		57		3
	35		15		45		43		17		55		5
	40		12		48		41		19		54		6
	45		8		52		38		22		53		7
	50		5		55		36		24		52		8
	55		1		59		33		27		50		10
83	0	4	58	85	2		31		29		49		11
	5		54		6		28		32		48		12
	10		51		9		26		34		47		13
	15		47		13		23		37		45		15
	20		43		17		21		39		44		16
	25		39		21		18		42		42		18
	30		36		24		16		44		41		19
	35		32		28		13		47		40		20
	40		29		31		11		49		39		21
	45		25		35		8		52		37		23
	50		22		38		6		54		36		24
	55		18		42		3		57		34		26
Azimuths		45. d. 0'.				60 d. 0'.				75 d. 0'.			

Houres		12		1.	11.	Compl.		2.	10.	Compl.	
Latit.		G.	M.	G.	M.	G.	M.	G.	M.	G.	M.
84	0	6	0	5	48	84	12	5	12	84	48
	5		55		43		17		8		52
	10		50		38		22		3		57
	15		45		33		27	4	59	85	01
	20		40		28		32		55		05
	25		35		24		36		50		10
	30		30		19		41		46		14
	35		25		14		46		42		18
	40		20		9		51		37		23
	45		15		4		56		33		27
	50		10	4	59	85	01		29		31
	55		5		54		05		24		36
85	0	5	0		50		10		20		40
	5		55		45		15		16		44
	10		50		40		20		11		49
	15		45		35		25		7		53
	20		40		30		29		3		57
	25		35		26		34	3	58	86	02
	30		30		21		39		54		06
	35		25		16		44		50		10
	40		20		11		49		45		15
	45		15		6		54		41		19
	50		10		2		58		37		23
	55		5	3	57	86	03		32		28
86	0	4	0		52		08		28		32
	5		55		47		13		23		37
	10		50		42		18		18		42
	15		45		37		23		15		45
	20		40		33		27		11		49
	25		35		28		32		6		54
	30		30		23		37		2		58
	35		25		18		42	2	58	87	02
	40		20		13		47		53		07
	45		15		8		52		49		11
	50		10		4		56		45		15
	55		5	2	59	87	01		40		20
Azimuths					15.*d*.0'.				30*d*.0'.		

Heures		3. 9.		Compl.		4. 8.		Compl.		5. 7.		Compl.	
Latit.		G.	M.	G.	M.	G.	M.	G.	M.	G.	M.	G.	M.
84	0	4	15	85	45	3	0	87	7	1	33	88	26
	5		11	85	49	2	58	87	02		32	88	28
	10		8	85	52		55	87	05		31	88	29
	15		4	85	56		53	87	07		30	88	30
	20		1	85	59		50	87	10		28	88	32
	25	3	57	86	03		48	87	12		27	88	33
	30		54	86	06		45	87	15		26	88	34
	35		50	86	10		43	87	17		24	88	36
	40		47	86	13		40	87	20		23	88	37
	45		43	86	17		38	87	22		22	88	38
	50		39	86	20		35	87	25		20	88	40
	55		36	86	24		33	87	27		19	88	41
85	0		32	86	28		30	87	30		18	88	42
	5		29	86	31		28	87	32		17	88	43
	10		25	86	35		25	87	35		15	88	45
	15		22	86	38		23	87	37		14	88	46
	20		18	86	42		20	87	40		13	88	47
	25		15	86	45		18	87	42		11	88	49
	30		11	86	59		15	87	45		10	88	50
	35		8	86	52		13	87	47		9	88	51
	40		4	86	56		10	87	50		7	88	53
	45		0	87	00		8	87	52		6	88	54
	50	2	57	87	03		5	87	55		5	88	55
	55		53	87	07		3	87	57		3	88	56
86	0		50	87	10		0	88	00		2	88	58
	5		46	87	14	1	58	88	02		1	88	59
	10		43	87	17		55	88	05		0	89	00
	15		39	87	21		53	88	07	0	58	89	02
	20		36	87	24		50	88	10		57	89	03
	25		32	87	28		48	88	12		56	89	04
	30		29	87	31		45	88	15		54	89	06
	35		25	87	35		43	88	17		53	89	07
	40		21	87	39		40	88	20		52	89	08
	45		18	87	42		38	88	22		51	89	09
	50		14	87	46		35	88	25		49	89	11
	55		11	87	49		33	88	27		48	89	12
Azimuths						15 d. 0'.				30 d 0'.			

Houres		12.		1. 11.		Compl.		2. 10.		Compl.	
Latit.		G.	M.	G.	M.	G.	M.	G.	M.	G.	M.
87	0	3	0	2	54	87	06	2	36	87	24
	5		55		49	87	11		32	87	28
	10		50		44	87	16		27	87	33
	15		45		39	87	21		23	87	37
	20		40		35	87	25		19	87	41
	25		35		31	87	29		14	87	46
	30		30		26	87	34		10	87	50
	35		25		20	87	40		6	87	54
	40		20		15	87	45		1	87	59
	45		15		10	87	50	1	57	88	03
	50		10		6	87	54		53	88	07
	55		5		1	87	59		48	88	12
88	0	2	0	1	56	88	04		44	88	16
	5		55		51	88	09		40	88	20
	10		50		46	88	14		35	88	25
	15		45		41	88	19		31	88	29
	20		40		37	88	23		27	88	33
	25		35		32	88	28		22	88	38
	30		30		27	88	33		18	88	42
	35		25		22	88	38		14	88	46
	40		20		17	88	43		9	88	51
	45		15		12	88	48		5	88	55
	50		10		8	88	52		1	88	59
	55		5		3	88	57	0	56	89	04
89	0	1	0	0	58	89	02		52	89	08
	5		55		53	89	07		48	89	12
	10		50		48	89	12		43	89	17
	15		45		43	89	17		39	89	21
	20		40		39	89	21		35	89	25
	25		35		34	89	26		30	89	30
	30		30		29	89	31		26	89	34
	35		25		24	89	36		22	89	38
	40		20		19	89	41		17	89	43
	45		15		14	89	46		13	89	47
	50		10		10	89	50		9	89	51
	55		5		5	89	55		4	89	56
Azimuths				15 *d.* 0'.				30 *d.* 0.			

Heures		3. 9.		Compl.		4. 8.		Compl.		5. 7.		Compl.	
Latit.		G.	M.	G.	M.	G.	M.	G.	M.	G.	M.	G.	M.
87	0	2	7	87	53	1	30	88	30	0	47	89	13
	5		4	87	56		28	88	32		44	89	16
	10		0	88	00		25	88	35		43	89	17
	15	1	57	88	03		23	88	37		43	89	17
	20		53	88	07		20	88	40		41	89	19
	25		50	88	10		18	88	42		40	89	20
	30		46	88	14		15	88	45		39	89	21
	35		43	88	17		13	88	47		37	89	23
	40		39	88	21		10	88	50		36	89	24
	45		35	88	25		8	88	52		35	89	25
	50		32	88	28		5	88	55		34	89	26
	55		28	88	32		3	88	57		32	89	28
88	0		25	88	35		0	89	00		31	89	29
	5		21	88	39	0	58	89	02		30	89	30
	10		18	88	42		55	89	05		28	89	32
	15		14	88	46		53	89	07		27	89	33
	20		11	88	49		50	89	10		26	89	34
	25		7	88	53		48	89	12		25	89	35
	30		4	88	56		45	89	15		23	89	37
	35		0	89	00		43	89	17		22	89	38
	40	0	57	89	03		40	89	20		21	89	39
	45		53	89	07		38	89	22		19	89	41
	50		50	89	10		35	89	25		18	89	42
	55		46	89	14		32	89	28		17	89	43
89	0		42	89	18		30	89	30		15	89	45
	5		39	89	21		27	89	33		14	89	46
	10		35	89	25		25	89	35		13	89	47
	15		32	89	28		22	89	37		12	89	48
	20		28	89	32		20	89	40		10	89	50
	25		25	89	35		17	89	42		9	89	51
	30		21	89	39		15	89	45		8	89	52
	35		18	89	42		12	89	47		6	89	54
	40		14	89	46		10	89	50		5	89	55
	45		11	89	49		7	89	52		4	89	56
	50		7	89	53		5	89	55		3	89	57
	55		4	89	56		2	89	57		1	89	59
Azimuths						15 *d.* 0'.				30 *d.* 0'.			

Many uses might be made of this Table, which for brevity sake I omit, and will only adde this, one how to make a table thereby of the heighth of the Sun for every houre and part of the day, in every degree and part of the Zodiack; which being necessary for contriving of Dials, upon all kind of Cylinders, Rings, Quadrants, and such like (wherein the heighth of the Sun is required) may generally be supplyed for all latitudes, by this table, as in this example appeareth.

1 Set downe the ordinary houres before and after noone.

2 By them the complements of the houre arches of this table, as they are found in the common meeting of the houre and latitude, or heighth of the pole above the plane.

3 The Logarithmeticall sines of those arches, adding the Radius to the Log. sine of the latitude.

4 Subduct the Log. sine of each arch, out of the Log. sine of the latitude, and there shall come forth the Log. sines of other arches, which reserve to be added as followeth.

5 Vnder the complements of the houre arches aforesaid, set the declinations of the Sun in the beginning of each signe, or of any part of the signe, if you will proceed to parts.

6 Subtract these declinations (beginning with 12) out of the complements of the houre arches (or contrary when there is cause) for Northerne signes, and adde them for Southern signes, so have you new arches answerable to each houre in every signe.

7 The Log. cosines of these arches added to the Log. sines reserved abovesaid, beget new Log. sines, which found in the Canon, afford the true altitudes of the Sun for each houre desired; only the Log. Cosine of 12 gives the heighth without correction.

8 Lastly, the complements of the arches proper to the Log. sines reserved, which helped to find the altitudes of the Sun in the rest of the Zodiacke, are the very altitudes themselves of the Sun above the Horizon in ♈ and ♎, all which being collected into a table (as here is done) it is ready for use; and note that when there is cause to use more houres then six, equall houres from six, have equall arches, and Logarithmes belonging to them.

Houres

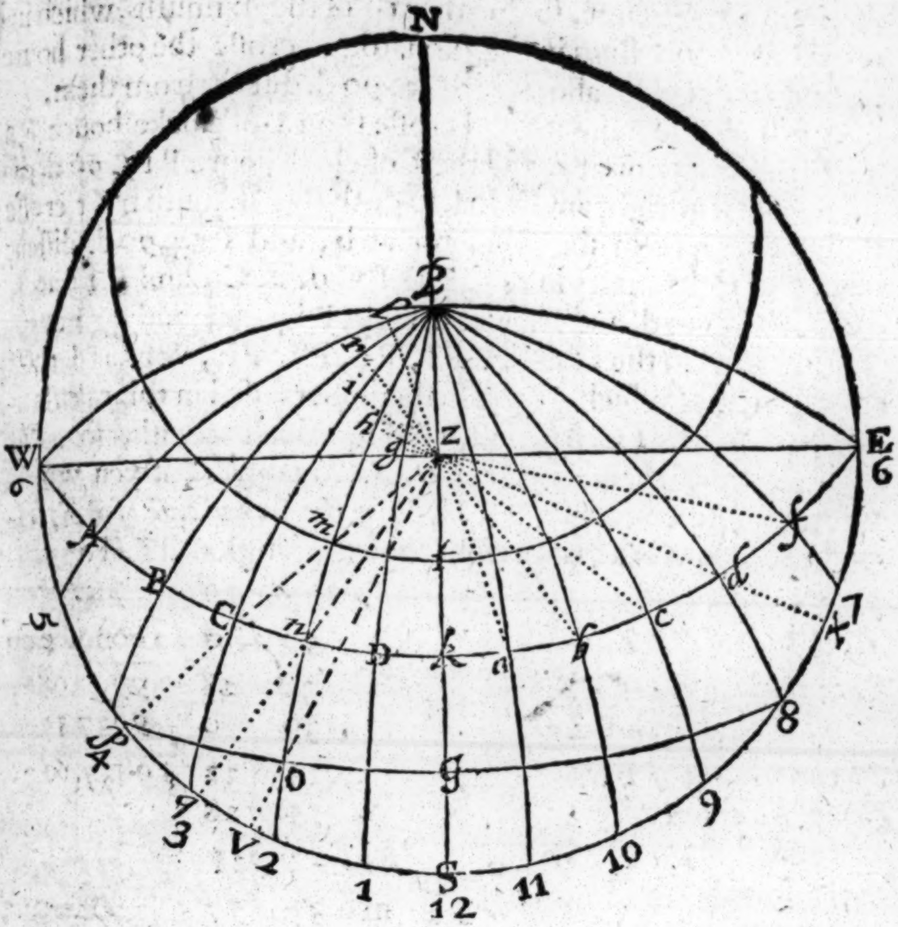
Houres before & after noone.		Comple: of the arches in the table		The Logarithmes of their sines.	New Log: found by subduction and reserue	Heighth of the Sun for each houre in euery signe.			
H.	H.	d	'			d ♈	0'	Houres.	
12	0	51	32	19893.74					
11	1	52	30	9899.47	9994.27	9	17	7	5
10	2	55	28	9915.82	9977.92	18	7	8	4
9	3	60	41	9940.41	9953.33	26	5	9	3
8	4	68	20	9968.18	9925.56	32	36	10	2
7	5	78	23	9991.01	9902.73	36	56	11	1
6	6	90	0	10000.00	9891.74	38	28		
5	7	101	37	9991.01	9902.73	♎		12	
4	8	111	40	9968.18	9925.56				
♋ ♑		23	31	The declinations of the Signes.					
♊ ♐ ♌ ♒		20	13						
♉ ♏ ♍ ♓		11	31						
		d	'	Cosines		d	'	Houres.	
		28	1	9945.87		61	59	12	
		28	59	9941.89	9936.16	59	41	11	1
		31	57	9928.66	9906.58	53	45	10	2
♋ Subtr.		37	9	9901.49	9854.82	45	43	9	3
		44	49	9850.87	9776.43	36	42	8	4
		54	52	9760.03	9662.76	27	23	7	5
		66	29	9600.59	9494.73	18	12	6	6
		78	6	9314.30	9217.03	9	29	5	7
		88	9	8508.97	8434.53	1	34	4	8
		31	19	9931.61		58	41	12	
		32	17	9927.07	9921.34	56	33	11	1
		35	15	9912.03	9889.35	50	55	10	2
♊ ♌ Subtr.		40	27	9881.37	9834.70	43	7	9	3
		48	7	9824.53	9750.09	34	14	8	4
		58	10	9722.18	9624.91	24	56	7	5
		69	47	9538.54	9432.28	15	42	6	6
		81	24	9174.74	9077.47	6	52	5	7

	40	1	9884	15			49	59	12	
	40	59	9877	89	9872	16	48	10	11	1
♉ ♍	43	57	9857	30	9835	22	43	11	10	2
Subtr.	49	9	9815	63	9768	96	35	59	9	3
	56	49	9738	24	9663	80	27	28	8	4
	66	52	9594	25	9496	98	18	18	7	5
	78	29	9300	27	9194	01	9	0	6	6
	63	3	9356	30			26	57	12	
	64	1	9641	58	9635	85	25	37	11	1
♏ ♓	66	59	9592	17	9570	09	21	49	10	2
Add.	72	11	9485	68	9439	01	15	57	9	3
	79	51	9246	07	9171	63	8	32	8	4
	89	54	7241	88	7144	61	0	05	7	5
	71	45	9495	77			18	15	12	
	72	43	9472	90	9467	17	17	3	11	1
♐ ♒	75	41	9393	19	9371	11	13	36	10	2
Add.	80	53	9199	88	9153	21	8	11	9	3
	88	33	8403	20	8328	76	1	13	8	4
	75	3	9411	58			14	57	12	
♑	76	1	9383	17	9377	44	13	48	11	1
Add.	78	59	9281	25	9259	17	10	28	10	2
	84	11	9005	80	8959	13	5	13	9	3

A Table of the altitude of the Sun for every houre of the day, in the beginning of each signe: Lati. 51d 32'.

Houres	12	11	10	9	8	7	6	5	4	
Houres		1	2	3	4	5	6	7	8	
	d '	d '	d '	d '	d '	d '	d '	d '	d '	
♋	61.59	59.41	53 45	45.53	36.42	27.23	18.12	9 29	1.34	♋
♊	58.41	56.33	50.55	43. 7	34.14	24.56	15.42	6 52	0	♌
♉	49.59	48.10	43.11	35.59	27.28	18.18	9 0	0		♍
♈	38.28	36.56	32.36	26. 5	18 7	9.17	0 0			♎
♓	26.57	25.37	21.49	15.57	8.32	0 5				♏
♒	18.15	17. 3	13.36	8.11	1.13					♐
♑	14.57	13.48	10.28	5.13						♑

To



To prove the truth of this calculation, which affordeth with so great facilitie the heighth of the Sunne in any signe or part for any houre or part of the day, let the Horizon, Æquator, Tropiques, and houre lines be drawne, parts of the generall Scheme, as is directed in the fourth Chapter; crosse the houre lines with those Azimuths, which intersect them at right angles, which is easily done, seeing you have two points, the one in the Æquator, the other in the Zenith, 'ready given to draw them by; for such is the harmony of the Sphericks in generall, but particularly of Azimuths and Houre circles, that as the South Azimuth coincident with the Meridian doth crosse the 12 of clock houre in the

the Æquator, and the six of clocke houre at right angles, 90 d. distant from the same, so doe the rest of the Azimuths, which intersect the houre lines in the Æquator, crosse the other houre lines at right angles also, which are 90 d. distant from them.

Thus doth the Azimuth a z l crosse the 11 of clocke houre P a 11 in the Æquator at a, and the 5 of clock houre P l 5. 90 d. distant from it at right angles in l, so doth the Azimuth b Z r, crosse the houre P b 10 in the Æquator at b, and P r 4, 90 d. distant from it at right angles in r, C Z I, P C 9, at C, and P I 3 at I, d Z h, P d 8, at d, and P h 2 at h. f Z g, P f 7, at f, and P g 1 at g.

The arches in the table are P l, P r, P I, P h, &c. and their complements (which are the first numbers used in this calculation) are l A, r B, I C, h n, g D and Z K which are either found *by the first part of the ninth case of O. S. Triangles*, if you worke with the obtuse triangle, P Z N, or *by the second case of R. S. triangles*, if you worke with right angled triangle P h Z. For

				Logar.
As the sine of P h Z		90 d.	0	10000.0000
Is to the tangent of P Z		38	28	9900.0865
So is the cosine of h P Z		30	0	9937.5306
To the tangent of P h		34	32	19837.6171
Complement h n		55	28	
	n m	23	31	
	m h	31	57	
	o h	78	59	

Substract n m 23 d. 31′. out of h n 55 d. 28′. there resteth m h 31 d. 57′. for 2 of clock in ♋, but adde n m or n o 23 d. 31′. unto h n 55 d. 28′. so have you h o 78 d. 59′. for 2 of clocke in ♑, and thus are all the rest of the numbers made up in the second colume of the Table, by adding and subtracting the declinations proper to them.

The first 9 numbers of the 3 colume are the Logarithmeticall Sines of the arches formerly found, only to the Logarithmes of 51 d. 32′. the elevation of the Pole, the Radius is alwayes to be added.

The first 8 numbers of the fourth colume are found by continuall

quall subtraction of those Logarithmes out of the Logarithme of the elevation of the Pole; so if you subduct 9915.82, proper to 10 and 2 of clock out of 19893.74, the Radius and elevation, there resteth 9977.92. the complement of the heighth of the Sun in ♈ or ♎ for 8 and 4 of clock, for in the Triangle n h d, *by the 15 of the 4 of Regiomontanus*.

			Logar.
As the sine of n h	55 *d.*	28'.	9915.8199
Is to the sine of h d	90	0	10000.0000
So is the sine of K Z	51	32	9893.7452
To the sine of Z d	71	53	9977.9253

The complement whereof Z h 18 d. 7'. equall to d x, is the altitude of the Sun in the Æquator at 8 or 4 of clocke 90 d. distant from P h n 2 of clock, and so of any other.

The rest of the numbers in the 3 Colume are the Logarithmeticall Cosines of the arches of the second Colume, which continually added to the Logarithmes of the fourth Colume, proper to the heighth of the Sun in the Æquator formerly found, doe make up the rest of the Logarithmeticall Sines of the fourth colume, which found in the Canon, give the altitudes desired, as may be likewise proved out of the Scheme by the triangles Z h m, Z h n, and Z h O, *by the ninth case of R.S. Triangles*. For

			Logar.
As the sine of Z h m *or* Z h O	90 *d.*	0'.	10000.0000
Is to the cosine of h m	31	57	9928.6570
Or h O	78	59	9281.1482
So is the cosine of Z h	18	7	9977.9253
To the cosine of Z m	36	15	9906.5823
Or Z O	79	32	9259.0735

Therefore m p 53 d. 45'. the complement of Z m, is the altitude of the Sunne for 10 and 2 of clocke in ♋, and O V 10 d. 28'. the complement of Z O, for the same houres in ♑, the

thing

thing desired, and thus may the calculation be proved out of the same Scheme for all the rest of the houres also.

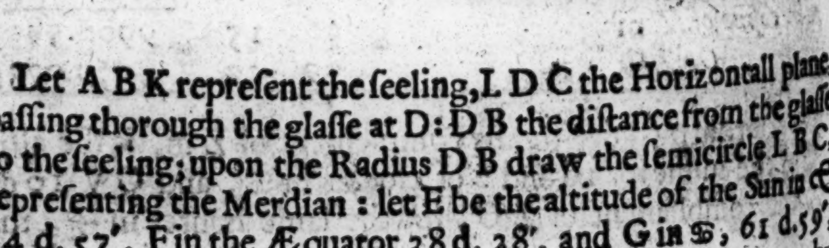
CHAP. XXXIV.

To draw a Diall upon the seeling of a Roome.

I Will now conclude this worke with a conceit of *Sconbergius*, who hath also borrowed the same from *Babtista benedictus*: *viz.* how to draw a Diall upon the seeling of a Roome, whereby we may see the houre of the day, by the reflected beames of the Sun, as we sit within doores. I confesse it is a pleasant thing, to behold how Art hath taught the Sun to trace out those lines and paralels by reflection from a glasse, which the direct beames can never shine upon.

The Demonstration.

The reason thereof is grounded upon that axiome of *Euclide* in his *Catoptriques*: that the angles of Incidence and Reflection are evermore equall; as may appeare by this Diagram.



Let A B K represent the seeling, L D C the Horizontall plane, passing thorough the glasse at D: D B the distance from the glasse to the seeling; upon the Radius D B draw the semicircle L B C, representing the Merdian: let E be the altitude of the Sun in ♑ 14 d. 57′. F in the Æquator 38 d. 28′. and G in ♋, 61 d. 59′, by

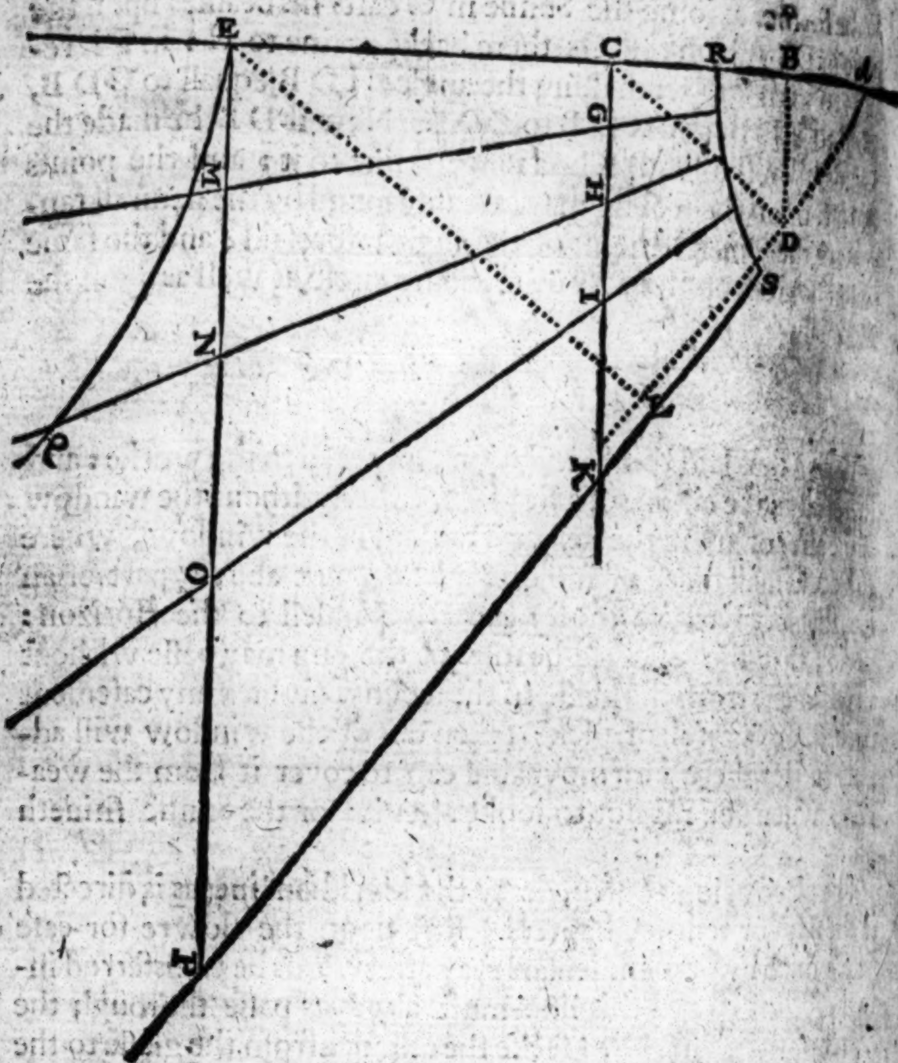
by the former axiome the Sunne in G casts his beames upon the glasse in D; which reflects them backe againe to H: in F it reflects to I: in E to K: making the angles H D B, equall to G D B, I D B to F D B, and K D B to E D B. Now if D B be made the Radius, then shall A B K be a tangent line to it: and the points H, I, K, upon the seeling may be easily found by the naturall tangents of the Complements of the angles aforesaid; and the same reason holdeth upon every other houre circle, as well as upon the Meridian.

The projection.

Having thus laid the foundation, proceed to the worke: and first of all make choice of a fit place, either without the window in the aire; or upon the Sell or Transam of the window, where to place a small piece of looking glasse (not above ¼ part of an inch diameter at the most) exeactly paralell to the Horizon: yet so, that the reflected beames of the Sun may passe without impediment from the glasse to the seeling, (which any casement opened, or quarrell of glasse taken out of the window will admit) and let there be a moveable cap to cover it from the weather, when you list not to looke after it, or the Sunne shineth not.

The place being chosen, draw the Meridian line (as is directed in the sixth or tenth Chapters) first upon the flowre for ease sake, which by perpendicnlars may afterwards be transferred into the seeling: and this line must alwayes passe thorough the center of the glasse. Next seeke the distance from the glasse to the seeling, wherein you must be very accurate, because this distance is the Radius to direct the rest of the worke, and must cut the Meridian line at right angles.

Suppose that Meridian line drawn upon the seeling, be A B C E, the place of the glasse (let into the Sell or Transam of the Window the thicknesse thereof,) at D the distance of the Glasse from the Seeling D B, make D B the Radius, then shall A C E be a tangent line thereto: and the severall points A, B, C, E, upon the Meridian, are easily found, by naturall tangents, without the trouble



trouble of calculation. For if you divide D B into 10 or 100 parts (as is directed in the first Chapter) B C shall be 1258, the naturall tangent of 51 d. 32′, the complement of the heighth of the Æquator : D C 1607 the secant thereof : B A 794 the naturall tangent of 38 d. 28′, the complement of the heighth of the Pole; and A the center of the Diall, where all the houre lines will meet abroad in the aire, if we had any need thereof : B R 532 the na-
turall

turall tangent of 28 d. 1', the complement of the heighth of the Sun in ♋, and B E 3745 the naturall tangent of 75 d. 3', the complement of the heighth of the Sun in ♑.

Thorough the point C draw the line C K at right angles to the Meridian, representing the Æquator upon the seeling: make C D the Radius of the Æquator, then shall C K be a tangent line thereunto: divide C D into 10 or 100 parts as afore, then shall C G be 268 of those parts, the naturall tangent of 15 d. for 11 and 1 of clocke, and C H 577, the naturall tangent of 30 d. for 10 and 2 of clocke: and C I 1000 equall to the Radius, the naturall tangent of 45 degrees for 9 and 3 of clocke: and C K 1732, the naturall tangent of 60 degrees for 8 and 4 of clocke, if the houres and 7 and 5 of clocke will not fall conveniently upon the seeling, they must bee supplied from an East and West window.

Having found the point G, H, I, K, upon this Æquinoctiall, thorough which the houre lines must passe: you may draw another paralell unto it, from any part of the Meridian where you will. Let that line be E P, drawne from the intersection of ♋, and the Meridian: from the point E raise a perpendicular to the axis A D continued to L, which will be paralell to C D, if there be no errour in the worke. Make E L a new Radius, which divide into 10 or 100 parts as afore, then shall E P be a tangent line thereunto; and the same naturall tangents, taken of this line divided, as formerly they were of C D, shall give the distances of M N O P from the Meridian, correspondent to the former: by each two points G M, H N, I O, and K P, draw streight lines: so shall you have the true houre lines, for the reflected beames of the Sun without any regard to the centre, which fals without the roome in the aire.

If you be desirous to draw the paralels of the Signes, (those two of ♋ and ♋ being necessary, for confining the length of the houre lines) or the diurnall arches, Almicanters, and the like, you have directions for them in the 27. 28 and 30 Chapters aforesaid, but if you will worke by the complements of the Suns altitude, make D B the Radius againe, the distance of the glasse and see-

feeling representing the perpendicular stile of the Horizontall. Then shall you find the altitudes of the Sun ready calculated in the end of the former Chapter, for every signe, and houre of the day: the naturall tangents of the Complements whereof taken of the same line diuided as afore, and set from B representing the foote of the perpendicular stile, upon each houre line diuided as afore, and set from B representing the foot of the perpendicular stile, and E Q are drawne, for ♋ ♑; you have the paralells desired.

The like may be done, upon any erect plane, South, North, East, West, or declining; alwayes placing the glasse the length of the pependicular stile, from the plane, supposed to be in the center of the earth.

And note that if you first draw the Diall in paper to your liking; you may (by helpe of a foot, divided into ten parts, and $\frac{1}{10}$ thereof by Diagonals into 100) transferre the same into the feeling, as was desired.

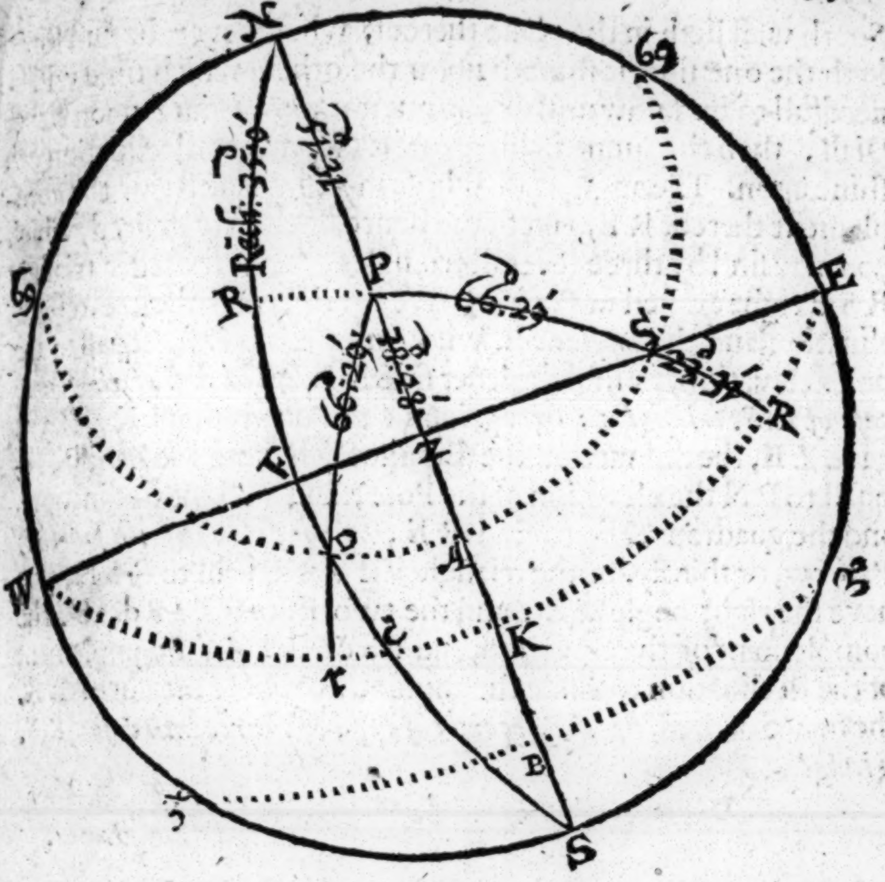
CHAP. XXXV.

Divers propositions necessary for Dialling.

PROPOSITION I.

The elevation of the Pole, and declination of the Sunne being given, to find at what houre the Sun passeth from the one side of the Prime verticall to the other.

AS the Spheare it selfe may be severall wayes projected in *plano*, so may the particular parts thereof necessary for this purpose; the usuall way is by making the limbe, or outward circle, to be the Meridian; so the face of the Scheme representeth the East or West Hemisphere: but



I rather retaine my firſt forme, which making the Horizon to be the limbe, the face thereof repreſenteth the upper or nether Hemiſphere, and wil ſerve much apter for this purpoſe) reſolving all the Propoſitions following by right angled Triangles alone, with the helpe of the heighth of the ſtile, and angle of the Meridian, which muſt of neceſſitie be firſt found, before any Diall can be made.

To reſolve this queſtion therefore, you may remember that NESW is the Horizon, NZS the Meridian, EZW the prime verticall, ♋ A ♋ the Tropique of Cancer, EKW the Equinoctiall, ♑ B ♑ the Tropique of Capricorne, P the North Pole, and Z the Zenith, PSR a Meridian, or houre Circle croſſing the Tropique of ♋ in the point S upon the prime Verticall: ſeeing then that every North and South wall

South wall lieth in the plane thereof, whensoever the Sun forsaketh the one side, it shineth upon the other; which time will be needfull to be knowne that you put not more houres upon either Diall, then the Sunne in his greatest Northerne declination can shine upon. The angle at P, whose measure is K R, or the complement thereof R E, giveth the houre of the day desired, which you may find by three severall triangles, for in the lesser triangle R S E right angled at R, you have the side R S the greatest declination, and the angle at E, whose measure is Z K, equall to the poles elevation, to find the lesser side R E *by the first of the fourth case of R.S. triangles:* or againe in the quadrantall K Z E you have Z K, the distance of the Equinoctiall from the Zenith, equall to P N the elevation of the Pole, and R S the declination, and the quadrant K E, to find R E, *by the second of the fourth of Pitiscus*, or thirdly, in the triangle P Z S verticall to R S E, you have the right angle at Z, and the two sides P Z 38 d. 28'. the complement of the elevation, and P S 66 d. 29'. the complement of the declination to finde the angle at P, whose measure is K R, the houre desired, *by the second case of the fourteenth case of R.S. triangles*. For

			Logar.
As the tangent of P S	*66 d.*	*29'.*	10361.35
Is to the sine of P Z S	90	0	10000.00
So is the tangent of Z P	38	28	9900.08
To the sine of Z S P	20	14	19538.73
Therefore Z P S	*69 d.*	*46'.*	

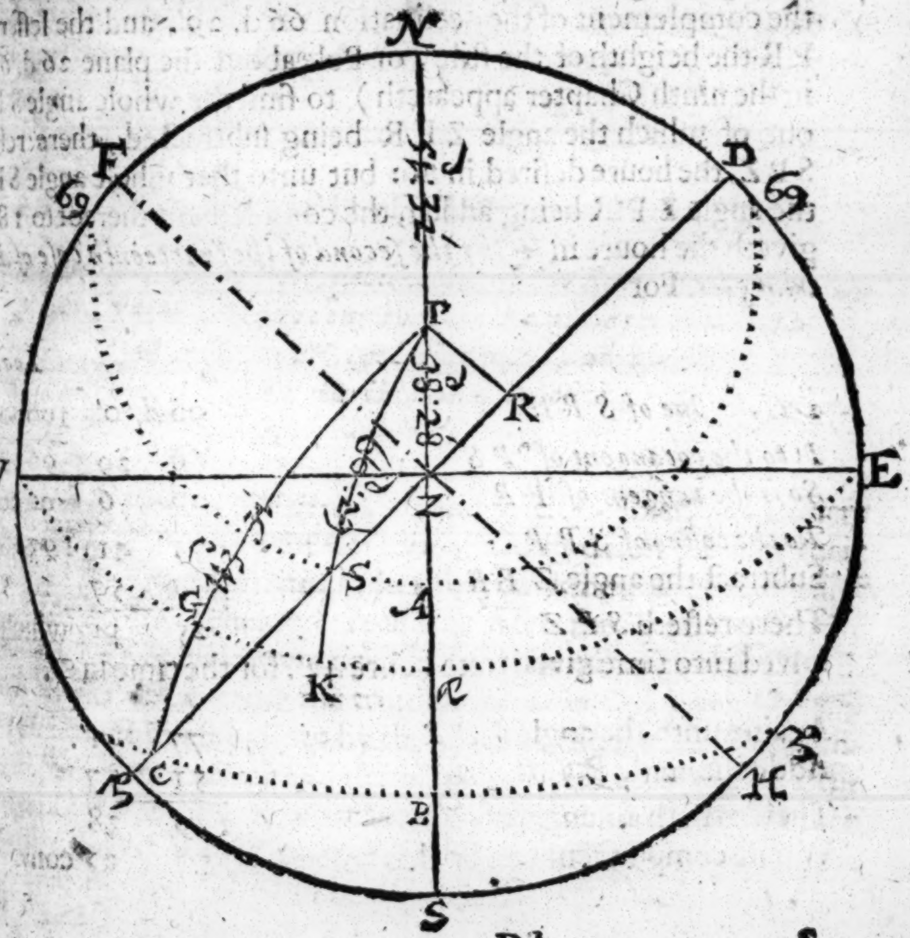
Which 69 degrees 46'. resolved into time, giveth foure houres 39'. for K R, reckoning from the Meridian, or the complement thereof 1 houre 21 for R E, accompting from the prime verticall or houre of six. Now then because the Sunne forsaketh the North wall 21'. after 7 in the morning, and returneth to it againe 21'. before 5 at night, it is needlesse to put upon that Diall 8 of clocke in the morning, or 4 at night, either of which houres the Sun can never shine upon in our latitude.

PRO-

PROPOSITION II.

The elevation of the Pole, and declination of the Sun being given, to find what time the Sun shall part from the one side of any declining plane to the other side thereof.

ALL erect planes declining lie under the azimuth of their declination; therefore let C Z R D be a declining plane, 45 degrees from E or W, as much as the Poles thereof H and F decline from the North and South parts of the Meridian N and S, cutting the tropiques of ♋ and ♑ in the points



S and C; and let P C, and P S, be two Meridians, or houre circles drawne from the Pole, crossing the tropiques upon the plane in the said points of C and S; the angles C P Z and S P Z, shall give the houres of the day, (whose measures upon the Equator are æ K, and æ G) when the Sun in each tropique forsaketh the one side of the Decliner, to shine upon the other; which you may find by the two oblique triangles C P Z, and S P Z (wherein two sides and an angle adjacent are given) *by the tenth case of O.S. triangles.* But by helpe of the angle betweene the two Meridians Z P R, and the heighth of the Pole above the plane P R (which must alwayes be found before you can make the Diall) you shall easily resolve this and the like questions by the right angled triangles S R P, and C R P: for in the first you have the right angle at R 90 d. 0'. and the base opposite thereto P S, the complement of the declination 66 d. 29'. and the lesser side P R the heighth of the stile, or Pole above the plane 26 d. 6 (as in the ninth Chapter appeareth) to find the whole angle S P R, out of which the angle Z P R being subtracted, there resteth S P Z, the houre desired in ♋: but unto that whole angle S P R, the angle Z P R being added, the complement thereof to 180 d. giveth the houre in ♑, *by the second of the fourteenth case of R.S. triangles.* For

			Logar.
As the sine of S R P	90 d.	0'	10000.00
Is to the cotangent of P S	66	29	9638.65
So is the tangent of P R	26	6	9690.10
To the cosine of S P R	77	41	19328.75
Subtract the angle *Z P R*	51	57	
There resteth *S P Z*	25	44	which re-

solved into time giveth one houre 43'. for the time in ♋.

Againe unto the angle *S P R*	77	41'.
Adde the angle *Z P R*	51	57
There ariseth an angle of	129	38
Whose complement to 180 d. is	50	22 converted into

into time, giveth 3 houres 21′. ½ for the time in ♃, when the Sun passeth from one side of the plane to the other; betweene which two limits the annuall varietie of the Sunne is concluded, wherefore you may put upon any Diall declining East 45 d. the houre of 3 of clocke, and declining West as much the houre of 9 of clocke, and a ¾ if you will, at which times the Sunne passeth to their opposite sides. And seeing by this calculation it plainly appeareth that the Sunne keeping the way of the Ecliptique precisely, may notwithstanding vary an houre and almost ¾ of time upon the same azimuth of Southeast or Southwest, upon which the Moone here at *London* maketh full Sea, both at full & change; which yet in respect of her latitude may alter the time more, let them that prescribe rules for the tydes consider how seldome the Moone commeth upon the S. W. or S. E. azimuthes just at the houres of 3 or 9, and regulate the times thereof accordingly.

PROPOSITION III.

The elevation of the Pole, declination of the Sun, and reclination of the Plane being given; to find what time the Sun forsaketh an E. or W. reclining plane, and shineth upon the inclining opposite thereto.

THe planes of East and West recliners or incliners lye in the circle of position denominating their reclination: Let that circle be S F N of the first Scheme, reclining from the Zenith upon the prime verticall E Z W the quantity of Z F 35 d. cutting the tropique of ♋ in the point D: and let the houre circle passing by the place of the Sun be P D ♈, intersecting the tropique and the plane in the same point D: the angle D P A, whose measure is r K, shall give the houre, when the Sun passeth from the upper face of the reclining plane, to the opposite the inclining and nether face thereof; which you may find by the quadrantall F Z S, and the verticall triangles C K S, and

and C r D : K C and C r measuring the angle at P, *by the first of the fift case of R.S. triangles*, but I rather resolve it by the right angled triangle D R P, having (*by the eleventh Chapter*) the angle R D N between the Meridians, and the side R P, the heighth of the stile above the plane, readie calculated; wherefore P D being 66 d. 29′. and P R 26 d. 41′. I say *by the second of the fourteenth case of R.S. triangles*.

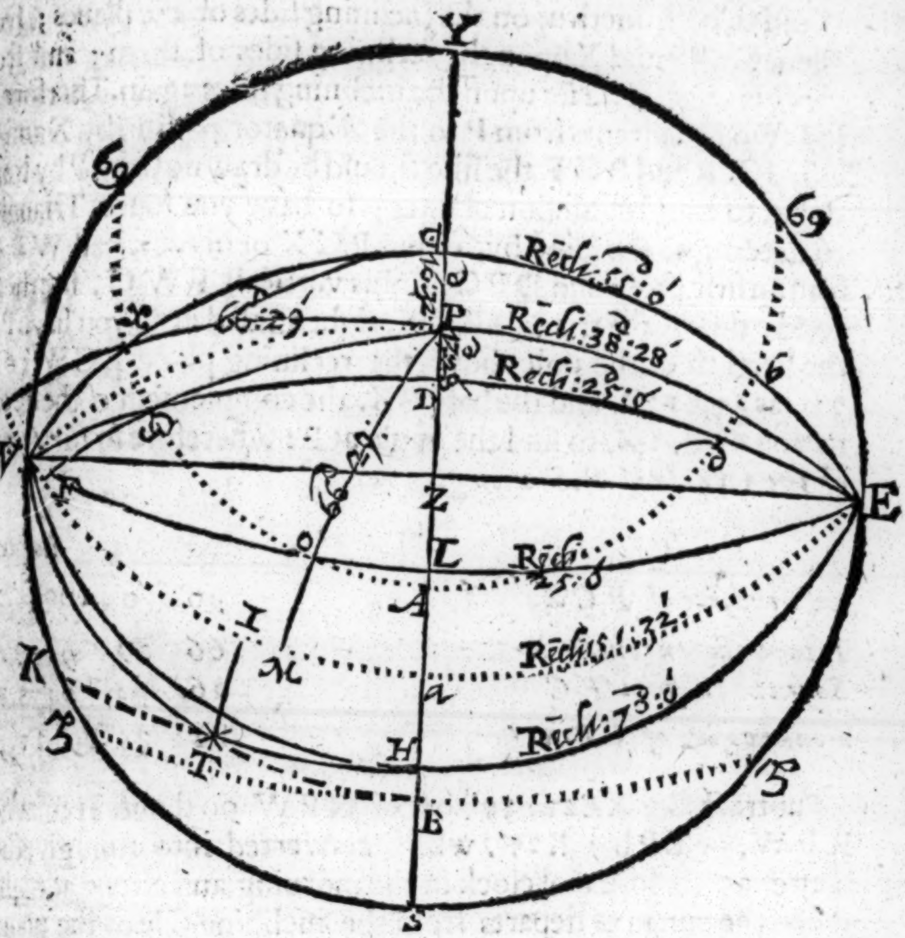
			Logar.
As the sine of P R D	90 d.	0′.	10000.00
Is to the cotangent P D	66	29	9638.65
So is the tangent P R	26	41	9701.21
To the cosine of D P R	77	22	19339.86
Unto which adde the angle R P N betweene the two Meridians	66	28	
There ariseth the angle D P N	143	50	
Whose complement to 180 d. giveth the angle D P Z	36	10	

Which 36 d. 10′. resolved into time, giveth 2 houres 24′. $\frac{1}{2}$ afternoone, when the Sun in the tropique of ♋ forsaketh the East reclining 35 d. and illuminateth the opposite the West inclining plane as much, or it giveth 2 houres 24′ $\frac{1}{2}$ before noone, when the Sunne parteth from the East inclining plane, and enlighteneth the West reclining as much.

PROPOSITION IV.

The altitude of the Pole, declination of the Sun, and reclination of the plane being given, to find what time the Sun shall forsake a North inclining plane, to shine upon the South reclining opposite thereto.

THere are six varieties of North and South reclining and inclining planes, as by the 12 Chapter more at large doth appeare: of the three South that which reclineth to the Pole, lyeth in the six of clock houre circle, represented in the scheme by



by the line E P W, and therefore the case is plane, that the Sunne alwayes passes from one side of the flat to the other, just at 6 of clock; and in the Southerne signes shines not at all upon the inclining side. The like may be said of E a W, the North reclining plane to the Equinoctiall; for during the time of the Sunnes abode in the Northerne signes, it onely shines upon the reclining part in the Southerne signes upon the inclining part thereof, but the times of the rest are thus to be found. The South reclining 55 degrees, represented by the circle E C X W, cutteth the tropique of ♋ in two places at X and B, so doth the South reclining 25 d. represented by E D G W, intersect it twice at G and d, by which

it

it plainly appeareth, that from the Suns riſe in ♋, till he come to b and d, he ſhineth upon the inclining ſides of the planes; from thence to G and X upon the reclining ſides of them; and from thoſe points till he ſet upon the inclining ſides again. Therfore let fall two Quadrants from P to the Æquator, paſſing by X and G, *viz.* P X R and P G F, the like ſhould be drawne from P by b and d, but to auoid confuſion of lines; ſo have you foure Triangles, to determine the ſame by, either P C X or his verticall W R X, for the firſt caſe: and D P G, or his verticall F W G, for the ſecond caſe. In the triangle P C X, right angled at C, you have P C the heighth of the pole above the reclining plane E C W 16 d. 32′. as *pag.* 138. and the baſe P X, the complement of the declination 66 d. 29′. to find the angle at P: wherefore *by the ſecond of the 14 caſe of R.S. triangles.*

			Logar.
As the ſine of P C X	90 *d.*	0′.	10000.00
Is to the cotangent P X	66	29	9638.65
So is the tangent P C	16	32	9472.53
To the coſine of C P X	82	35	19111.18

Subtract C P X 82 d. 35′. out of N P W 90 d. there remaynes R P W. or E P b 7 d. 25′. which converted into time giveth 0 houres 30′. before 6 of clock in the morning, and after 6 at night, when the Sun in ♋ departs from the inclining ſide of the plane, and ſhines upon the reclining and contrary. In like manner, in the triangle D P G, you have P G, the ſame with P X, 66 d. 29′. and P D the heighth of the South Pole above the reclining plane E D W, 13 d. 28′. as *pag.* 144. and the right angle at D, to find the angle P, wherefore by the ſame caſe,

			Logar.
As the ſine of P D G	90 *d.*	0′.	10000.00
Is to the cotangent P G	66	29	9638.65
So is the tangent P D	13	28	9379.24
To the coſine of G P D	84	2	19017.89

Sub-

Subtract G P D 84 d. 2'. out of a P W 90 d. there remaynes W P F or E P d, 5 d. 58'. which converted into time, giveth o houres 24', after and afore 6 of clock, when the Sunne in ♋ forsakes the inclining side of that plane, to illuminate the opposite, the reclining part thereof, and contrary. And thus may you be satisfied for any other declination of the Sun whatsoever.

PROPOSITION V.

The altitude of the pole, declination of the Sun, and reclination of the plane being given, to find what time of the day or yeare the Sunne forsaketh the North reclining part, to shine upon the South inclining part thereof.

IN the former scheme, the circles E L W, E a W, and E H W, represent the three sorts of North recliners; whereof that which reclineth 51 deg. 32'. lyeth in the plane of the Equinoctiall circle, of which I have spoken before. For the plane reclining 25 d. represented by the circle E L W during the Suns southerne declination, it only shines upon the inclining side: but during his abode in the Northerne signes, some part of the day upon the reclining side, and some part upon the inclining, as doth plainly appeare in the scheme; for from the sunne rise in ♋, till it come to 25 d. where the tropique cutteth the plane, it shineth upon the reclining side, from 25 to O upon the inclining side, and from O to the Sun setting in ♋ upon the reclining side againe: which times are thus to be found. Draw a Meridian, or houre circle from P to M, in the Æquator, by O the intersection of the plane and tropique; the like may be drawne on the other side also; the angle M P a giveth the time desired: which may be found by three severall triangles: for in the quadrantall W a L, you have L a 26 d. 32'. and O M 23 d. 31'. and the quadrant a W 90 d. to find the side M W, whose complement is M a, the time desired; *by the second of the fourth of Pitiscus*, or in lesser triangle W M O, you have the angle

gle at W, whose measure is L a, and the lesser side M O, to find the greater side M W, *by the second of the fourth case of right angled Sphericall Triangles:* or lastly, in the verticall triangle P O L, you have the right angle at L, and the base P O opposite thereto 66.d 29', and the greater side P L 63 d. 28', to find the lesser angle at P, *by the first of the 14 case of R.S. triangles.* For

			Logar.
As the sine of P L O	90 d.	0'.	10000.00
Is to the cotangent P O	66	29	9638.65
So is the tangent of P L	63	28	10301.63
To the cosine of O P L	29	22	9940.28

Which 29 d. 22'. resolved into time, giveth 1 houre 7. 1/2 both before and afternoone, when the Sun in Cancer forsaketh, and returneth againe to the reclining part of the plane.

In like manner, during the abode of the Sunne in Northerne signes, it only illuminateth the upper face of the plane, reclining 70 d. represented by the circle E H W, the rest of the yeere it shineth upon both (whose times are easily found by the declination) untill the Meridionall recesse of the Sunne from the Zenith be greater then the reclination of the plane, and then it shineth only upon the inclining part thereof. To find the time of the yeere for that, first draw the Ecliptique line W T B, then subtract Z a the reclination of the Equinoctiall 51 d. 32'. out of Z H, the reclination of the plane 70 d. there will rest a H 18 d. 28'. the declination of the paralell, when the Sunne forsaketh the reclining side, and onely shineth upon the inclining side of the plane; by the declination and amplitude draw this paralell K H (or seek the center thereof by the rules of the fourth Chapter) which shall crosse the Ecliptique W B at T, whose degree and minute, from either cardinall point I would know. In the quadrantall W B a I have the greatest declination given B a, and the particular declination of the plane, or paralell T I, equall to H a; to find the side W T, *by the first axiome of Pitiscus R. S. triangles:* or in the small triangle T I W, to find the same, *by the first of the eight case of R. S. triangles.* For

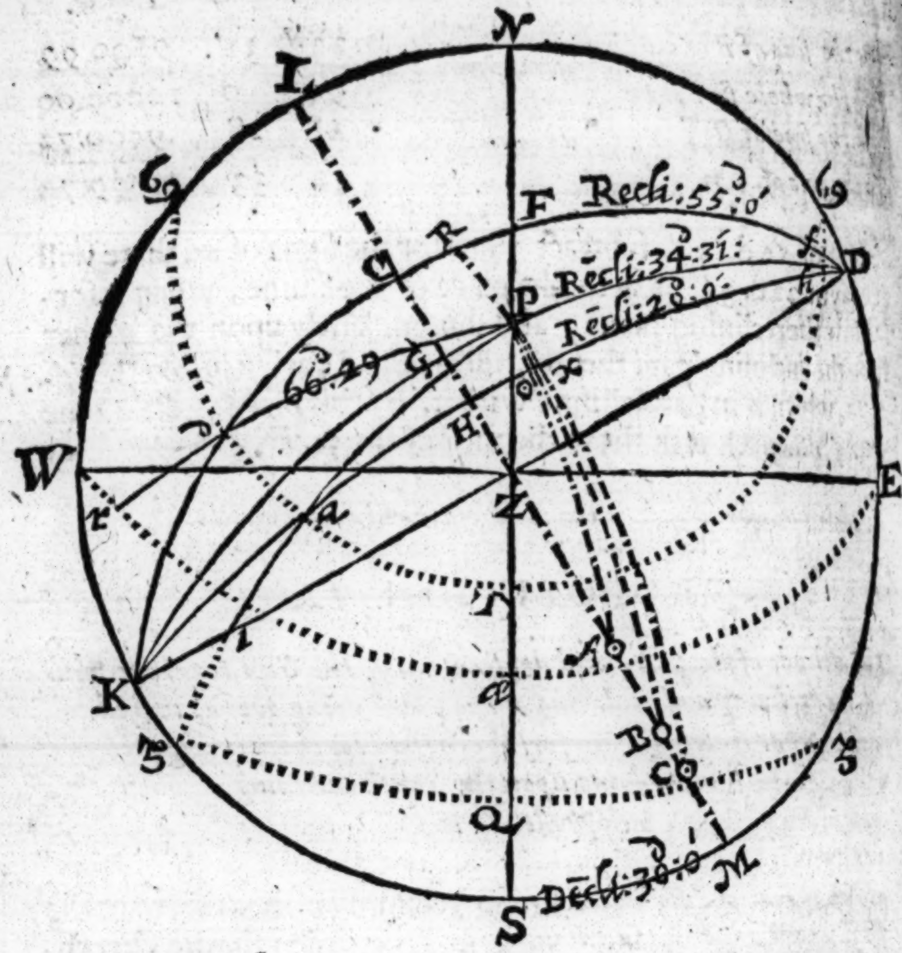
			Logar.
As the sine of B a	23 d.	31′.	9600.99
Is to the whole sine B W	90	0	10000.00
So is the sine of T ♃	18	28	9500.72
To the sine of T W	52	33	9899.73

Out of 52 d. 33′. subtract 30 d. for the signe of ♎, there will remayne 22 d. 33′ of ♏ for the place of the Sunne, when it forsaketh the reclining plane, and shineth onely upon the nether face the inclining part thereof, till it ascend againe into 7 d. 27′. of ♒, which is in paralellisme with it, by this place of the Sunne every Almanack will shew the time of the yeere.

PROPOSITION VI.

The altitude of the pole, and declination of the Sun, together with the declining and reclining of the plane being given, to find what time the Sun forsaketh the North inclining side, to shine upon the South reclining opposite thereto.

IN declining reclining planes there are the same varieties, that are in the direct reclining; the first three cases are represented in this Scheme, wherein let K Z D be a South declining plane from E or W 30 d. as much as the poles thereof M, L, decline from S or N of the Meridian, and let the three reclining planes bee K H D 20 d. o′. the example of the 15 Chapter, and K G D 34 d. 31′. the example of the 14 Chapter, and K F D, 55 d. o′. the example of the 16 Chapter, in all which I would find the time that the Sunne forsaketh the one side of the plane, to shine upon the other; And first you may observe from the bare sight of the scheme, because the tropique of Cancer ♋ F ♋, crosses each of these planes in two places,



places, once at f and h, againe at a and d, that therefore the Sun in that tropique will both Morning and Evening shine upon the inclining parts of these planes, untill the amplitude thereof be 30 degrees equall to the declination of the planes, from which time following hee shineth upon the inclining part no more in the Morning. Now then draw P d r, and P a I two Meridians, or houre circles, from the pole P, crossing the planes K C D, and K H D, in the tropique of ♋ at d and a: the like should be done at f and h, but to auoid confusion of lines; In the right angled triangle P R D you have the base P d, the complement of the declination 66 d. 29′. and the side P R, the heighth of the pole or stile

stile above the plane, found by the 16 Chapter to be 19 d. 25'. and in the same place the angle R P N, betweene the two Meridians 17 d. 38'. (which two things I borrow as often as there is cause, to facilitate the worke, considering they must of necessity be found before the Diall can be made) by helpe whereof to find the angle d P R. *by the second of the 14. case of R. S. Triangles.*

			Logar.
As the sine of P R d	90 d.	0'.	10000.00
Is to the cotangent P d	66	29	9638.65
So is the tangent of P R	19	25	9547.14
To the cosine of d P R	81	11	19185.79

Vnto the angle d P R 81 d. 11'. adde the angle N P R, 17 d. 38'. the whole angle N P D is 98 d. 49'. 90 d. is 6 houres, therefore 8 d. 49'. resolved into time, giveth o houre 35'. before six at night, when the Sunne in ♋ forsaketh the plane reclining to shine upon the inclining side thereof, or againe the angle d P R is equall to æ P r, 81 d. 11'. which resolved into time, gives five houres, 25'. from noone. In like manner in the triangle P X a, right angled X, you have P a 66 d. 29'. as afore, and P X the length of the stile, 13 d. 49'. and X P O 28 d. 52'. the angle of the Meridians by the 15 Chapter, to find a P O the angle desired, *by the second of the 14 case of R. S. Triangles.* For

			Logar.
As the sine of P X a	90 d.	0'.	10000.00
Is to the cotangent P a	66	29	6638.65
So is the tangent P X	13	49	9390.81
To the cosine of a P X	83	51	19029.46

Out of the angle a P X 83 d. 51'. subtract the angle X P O 28 degrees 52'. there remaynes the angle a P O 54 degrees 59'. which converted into time, giveth three houres 40'. afternoone, when the Sunne parteth from the plane reclining 20 degrees 0'. and shineth upon the inclining part opposite thereto.

to: For the times at f and h, when the Sunne neere his rising forsaketh the inclining sides of these planes, to shine upon the reclining sides thereof, you need resolve no Triangle, f P R being equall to d P R. Wherefore as you adde R P N, 17 d. 38'. to d P R, so must you subtract it from f P R, and there will remain f P N 63 d. 33'. which converted into time, gives 4 houres 14'. from midnight, that is neere a ¼ after 4 when the Sunne leaveth the inclining part of that plane; likewise h P X is equall to a P X, therefore adde X P o 28 d. 52'. unto h P X 83 degrees 51'. the whole angle h P O is 112 degrees 43'. whose complement to 180 d. gives N P h 67 d. 17'. either of which resolved into time, giveth the houre respectively, *viz.* 112 d. 43'. giveth 7 houres 31'. from noone, or 67 d. 17'. giveth 4 h. 29'. from midnight, when the Sun leaveth the inclining side, and shineth upon the opposite side reclining 20 d. 0'. Lastly, every plane reclining to the pole, as K P D doth, is coincident with some houre circle or part, and therefore the Sun in what parallell soever, passeth from one side of that plane to the other, at the same houre and minute; which you may find either by the triangle G P Z, *by the second of the fifteenth case*, or by the verticall to it N P D, *by the second of the sixteenth case of R. S. Triangles.* For

			Logar.
As the sine N P	51 *d.*	32'.	9893.74
Is to the sine of P N D	90	0	10000.00
So is the tangent of N D	60	0	10238.56
To the tangent of N P D	65	41	10344.82

Vnto which G P Z *is also equall.*

Which 65 d. 41'. being converted into time, doth give 4 houres 23'. almost, reckoned from midnight, when the Sun passeth of the inclining to the reclining plane, and reckoned from noone, when he forsaketh the reclining, and shineth upon the inclining side againe. And thus it continueth till the Northerne amplitude of the Sun be equall to E D 30 d. the declination of the plane, from thence forth it shineth no more upon the inclining part in the morning, and when the Southerne amplitude of the Sun

Sun is equall to W K 30 d. the declination of the plane, then it forsaketh the inclining side at the evening also, and the rest of the yeere it onely enlighteneth the reclining side of the plane.

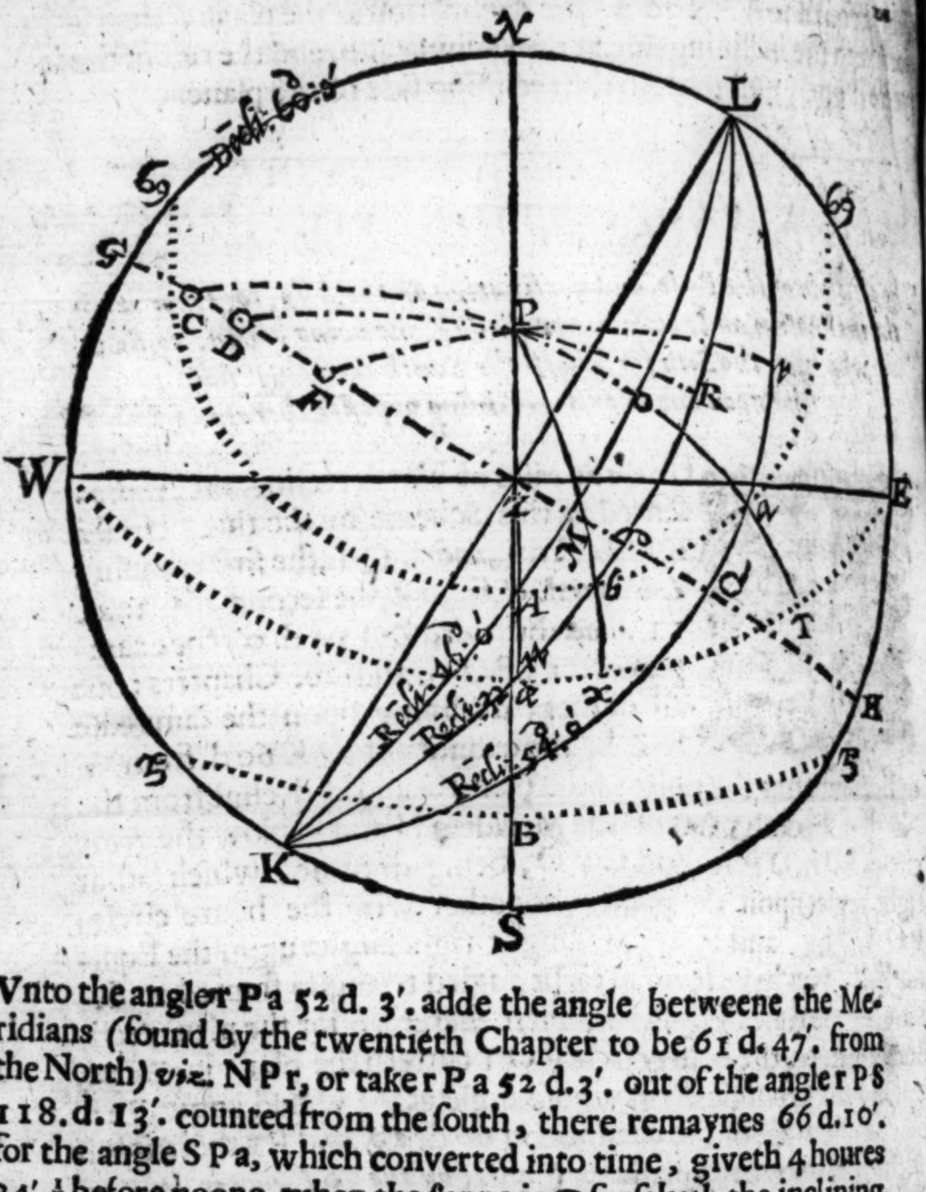
PROPOSITION VII.

The altitude of the Pole, and declination of the Sun, together with the declination and reclination of the plane being given, to find what time the Sun forsaketh the South inclining side, to shine upon the North reclining opposite thereto.

THe three cases of North recliners are represented in this Scheme by the three circles K M L, K d L, and K Q L, the first reclining Z M 16 d. 0'. from Z, the second Z d. 32. d. 11'. and the third Z Q 54 d. 0'. the examples of the 18. 19. and 20. Chapters: but all of them declining upon the same base K Z L, the quantity of W K 60 d. from W or E, as much as the poles of the plane G and H decline from the North and South parts of the Meridian N and S. Now the great circles F P r, D P R, and C P O, being drawne, which fall at right angles upon the planes, together with the houre circles P O T, P b x, and P A æ, falling at right angles upon the Equinoctiall, you have severall right angled triangles framed to determine the times required; First therefore for the plane reclining 54 d. 0'. the houre circle P O T cutteth the plane in ♋ at a, making the triangle P r a, whose angle at P I would know. P a is the complement of the declination 66 d. 29'. and P r the heighth of the stile above the plane 54 d. 43'. *(by the 20 Chapter)* wherefore *by the first of the fourteenth case of R. S. triangles:*

			Logar.
As the sine of P r a	90 d.	0'.	10000.00
Is to the cotangent P a	66	29	9638.65
So is the tangent P r	54	43	10150.21
To the cosine of R P a	52	3	9788.86

Vnto



Vnto the angle r P a 52 d. 3'. adde the angle betweene the Meridians (found by the twentieth Chapter to be 61 d. 47'. from the North) *viz.* N P r, or take r P a 52 d. 3'. out of the angle r P S 118. d. 13'. counted from the south, there remaynes 66 d. 10'. for the angle S P a, which converted into time, giveth 4 houres 24'. ½ before noone, when the sunne in ♋ forsaketh the inclining side of the plane, and shineth upon the reclining side thereof.

In the next case, the houre circle P b X crosseth the plane in ♋ at b, and maketh the triangle P R b, wherein as afore, I have the base P b 66 d. 29'. and the side P R (found by the 18 Chapter) 42 d. 52'. the heighth of the stile above the plane, and in the same place,

place, the angle betweene the Meridians N P R 90 d. as it is in all declining reclining, which passe thorough the intersection of the Meridian and Equinoctiall, wherefore *by the second of the* 14 *case of R. S. triangles.*

As the sine of P R b	90 *d.*	0′.	10000.00
Is to the cotangent P b	66	29	9638.65
So is the tangent P R	42	52	9967.63
To the cosine of b P R	66	11	X9606.28

Out of the angle æ P R 90 0′. take the angle b P R 66 d. 11′. there will remayne 23 d. 49′. for the angle æ P b, which converted into time, giveth 1 houre 35′. before noone, when the sunne leaveth the inclining, and shineth upon the reclining side of the plane. Lastly, the Meridian or houre circle P A æ cutteth the reclining plane K M L in ♋ at A; wherefore in the triangle P O A, I have the right angle at O, and the base P A opposite therto 66 d. 29′. as afore, and the side P O, the heighth of the stile above the plane (found by the 19 Chapter) 30 d. 59′. and in the same place the angle æ P O betweene the two Meridians 76 d. 10′. by helpe whereof to give the small angle æ P A, *by the second of the* 14. *case of R. S. triangles.* For

			Logar.
As the sine of P O A	90 *d.*	0′.	10000.00
Is to the cotangent of P A	66	29	9638.65
So is the tangent of P O	30	59	9778.49
To the cosine of A P O	74	51	X9417.14

Out of the angle betweene the Meridians æ P O 76 d. 10′. take the angle A P O 74 d. 51′. there will remayne the small angle æ P A, 1 d. 19′. which converted into time, giveth 0. houre 5′. only before noone, when the sunne forsaketh the inclining, and shineth upon the reclining side of the plane: And these be all the varieties, that can happen upon any kind of plane; many other uses may be made of these propositions, though for the present

ſent worke they ſerve but to leave the ſuperfluous houres out of every Diall.

PROPOSITION VIII.

The altitude of the Pole, and declination of the Sunne, together with the declination, or reclination, or declination and reclination of any plane being given; to find in what Country it would be a horizontall plane.

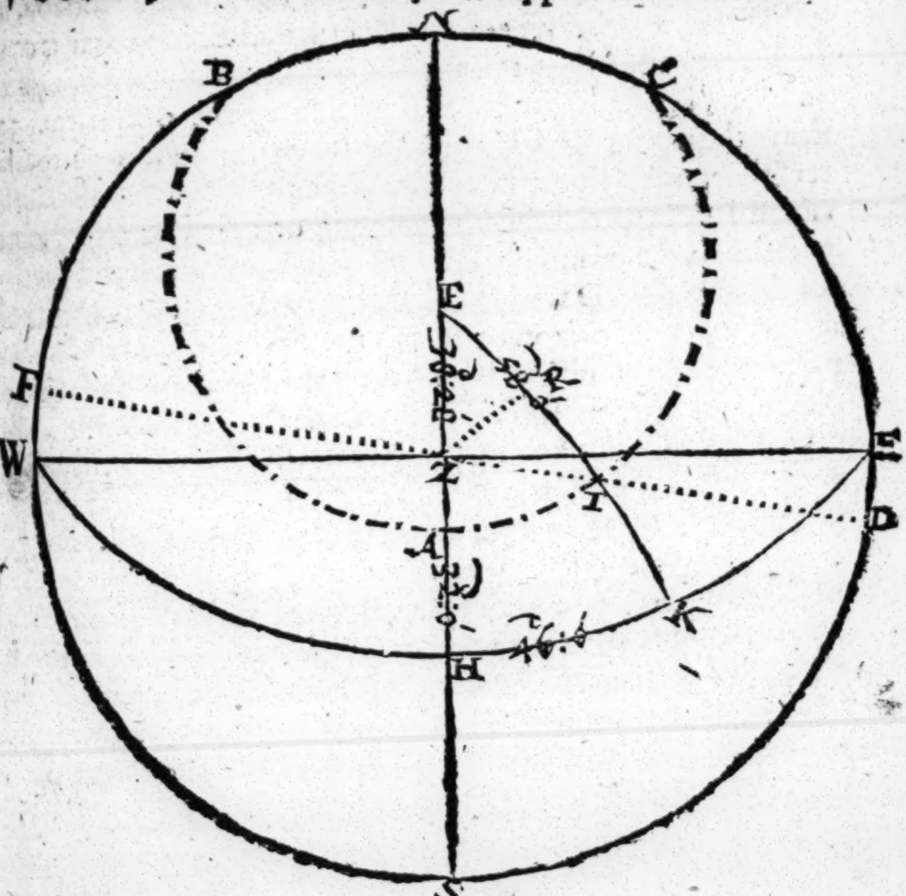
TO resolve this queſtion, there is one generall rule, *viz.* the Diall being calculated to any declination, or reclination, or declination and reclination given, the angle betweene the two Meridians of the place and the plane is the longitude, and the heighth of the ſtile, or pole above the plane, is the latitude of that Countrey, where the plane propoſed would be horizontall: and the declination Eaſt or Weſt ſheweth the bearing of the place from us; if the Subſtile happen upon any houre line, then are the Dials of both places the ſame, reckoning the houre of 12 (and the reſt in order) from the Meridian of the place, in the one, and from the Meridian of the plane in the other; if otherwiſe you may eaſily put on the horizontall houre lines proper thereunto, by the direction of the 27 Chapter.

PRO-

PROPOSITION IX.

The longitude and latitude of any place being given, to make a plane in our latitude paralell thereto.

IN the Diagram adjoyning, let N E S W be the Horizon at *London*, Z the Zenith, and pole thereof, E H W the Equinoctiall of that latitude, whose distance from the Zenith is equall to the elevation of the Pole P above the Horizon; N P Z S the Meridian of *London*, & E Z W the prime vertical there; now suppose I would frame



a plane here, lying in the longitude and latitude of *Hierusalem*, or any other famous Citie within our *Hemisphere*, whereupon to make a Diall that shall shew the houres of that particular place.

Considering therefore that the difference of longitude betweene any two places, is an arch of the Æquator betweene the Meridians of the one and the other, subduct the longitude of *London* (which in the 180 page of Master *Wrights errours of Navigation*, is 22 d. 0′.) out of the longitude of *Hierusalem*, which in the same place is 68 d. 0′. the remainder 46 d. 0′. must be set upon the Equinoctiall from H to K Easterly: and from P the Pole at *London*, a great circle must be drawne to K, representing the Meridian of *Hierusalem*, 46 d. 0′. to the Southeast of our Meridian. Againe, considering that the latitude of every place is an arch of the Meridian betwixt the Pole and the Horizon, unto which the arch betweene the Zenith and Equinoctiall is equall; by the latitude H A 32 d. and the amplitude E C 58 d. 25′. found in the table of amplitudes answerable to the declination 32 d. draw the paralell B A C, (or seeke the center by the fourth Chapter) thorough I the intersection of the parall B A C, and the Meridian P I K, draw the streight line or azimuth Z I D, so have you an oblique triangle P Z I, by which to resolve this question, for the angle S Z D will give the declination of the plane, it being an arch of the Horizon betwixt our Meridian and the Azimuth passing by the Zenith of the place to the Horizon; and the complement of Z I, the distance betweene the two Zeniths, doth give the reclination of the plane, which is an arch of the said azimuth betwixt our Zenith and the reclining plane, and are thus to be found. In the oblique triangle P Z I you have the side P Z, the complement of the elevation of the P 38 d. 28′. and the side P I the complement of the declination of the paralell 58 d. 0′. and the angle comprehended by them Z P I, 46 d. 0′. the difference of longitude betweene *London and Hierusalem*, to find the side Z I, *by the sixth case of O. S. Triangles.* Wherefore first let fall the perpendicular Z R. Then *by the case of O. S. triangles.*

As

			Logar.
As the sine of Z R P.	90 *d.*	0'.	10000.00
Is to the tangent of Z P	38	28	9900.09
So is the cosine of R P Z	46	0	9841.77
To the tangent of P R	28	54	~~1~~9741.86
Which taken out of the side P I	58	0.	
There remaynes R I	29	6	

Then againe:

			Logar.
As the cosine of P R	28 *d.*	54'.	0057.76. *Ar. Compl.*
Is to the cosine of P Z	38	28	9893.74.
So is the cosine of R I	29	6	9941.40.
To the cosine of Z I	38	36	~~1~~9892.90.

Whose complement 51 *d.* 24'. is the reclination sought for.

			Logar.
As the sine of Z I	38 *d.*	36'.	0204.89. *Arith. Compl.*
Is to the sine of Z P I	46	0.	9856.93.
So is the sine of P I	58	0.	9928.42.
To the sine of the angle P Z I	77	54	~~1~~9990.24.

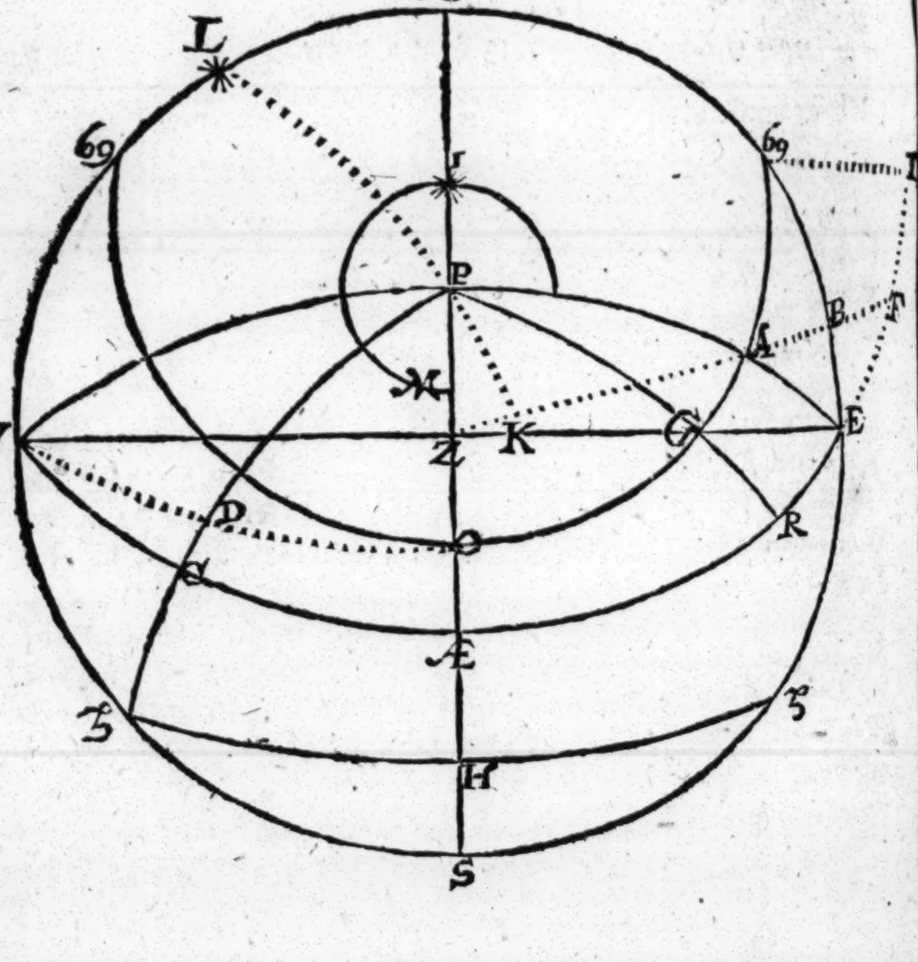
The true angle P Z I is 102 d. 6'. and the complement thereof to 180 d. S Z D is 77 d. 54'. the angle of declination which we seeke for; but because there is no sine greater then 90 d. the complement of the obtuse angle to 180 d. is produced by the worke.

To conclude then, the plane which in our latitude of *London*, will lie parall to the longitude, and latitude of *Hierusalem*, must decline from our Meridian Eastwards 77 d. 54'. and recline from our Zenith Northwards 51 d. 24'. which was the thing desired.

CHAP. XXXVI.

Divers other Propositions of the Spheare in ordinary use to be performed by right angled sphericall triangles only.

IN the Scheme adjoyning, let N E S W be the Horizon, N P Æ S the Meridian, E Z W the prime verticall, ♋ G ♋ the tropique of *Cancer*, E Æ W the Æquator, ♑ H ♑ the tropique of Capricorne, P G R a Meridian or houre circle, crossing the prime verticall in the point G, the Sun being



in the tropique of *Cancer*, E P W the houre circle of 6 of clock, Z A B the azimuth of the Sunne crossing that houre circle in the point A, the Sunne being in the tropique of Cancer, W D G a quarter of the Ecliptique, and P D ♑ a Meridian drawn from the Pole to the place of the Sun set upon the Horizon in ♑, crossing the Ecliptique in D. and the Equinoctiall at right angles in C.

Let the triangle W C D of the Scheme represent the triangle ♈ R ♉ of *the* 1. *Case of R. S. Triangles*, W D is part of the Ecliptique, W C part of the Æquator, and D C part of the circle of declination, falling at right angles upon the Equinoctiall in C.

1 The greatest declination of the Sunne which is the angle at W, and his distance from the next Equinoctiall point W D being given, to find D C the particular declination of any degree of the Ecliptique: worke *by the first varietie of the first case of R. S. triangles.*

2 By the same *data* to find W C the right ascention, worke *by the second of the second case of R. S. triangles.*

3 By the right ascention W C, and declination D C, to find W D the distance of the Sun from the next Equinoctiall point, worke *by the ninth case of R. S. triangles.*

4 By the same *data* to find the angle D, which the Meridian maketh with the Ecliptique, worke *by the second of the* 16. *case of R. S. Tringles.*

5 By the right ascention W C, and the distance of the Sunne from the next Equinoctiall point W D, to find the angle W, the greatest declination, worke *by the first varietie of the fourteenth case of R. S. triangles.*

Now these five parts may be varied 30 severall wayes, as by the 16 cases appeareth, *viz.* the particular declination five wayes more, *by the first varieties of the first six cases*, and the right ascention five wayes more *by the second varieties of the same six cases*, and the place of the Sun five wayes more, *by the seventh, eighth, ninth, and tenth cases*, and the angle of the Meridian, and the Ecliptique five wayes more, *by the second varieties of the sixe last cases*, and the greatest declination five wayes more, *by the first varieties, of the last six cases of R. S. triangles.*

Againe let the triangle W C ♑ of the scheme represent the triangle ♈ R ♉ of *the first case of R.S. triangles.* C W ♑ may be the East or West point, where the Æquator and Horizon intersect each other, W ♑ part of the Horizon from that point to the place of Suns rise or Suns set, ♑ C part of the Meridian passing by the place of the Sunne, and falling upon the Æquator at right angles in C, and this triangle is properly framed under the Horizon, as is E T ♋, by continuing the Æquator to the Meridian (like the example of the sixt Chapter) but would be equall to this being opposite thereto, which therefore I retaine.

6 The complement of the heighth of the Pole, which is the angle at W, and the declination of the Sun, which is C ♑, being given to find the difference ascentionall W C, equall to E T, worke *by the second of the fourth case of R. S. Triangles.* This difference ascentionall added to 90 d. in North signes, and subducted in South signes, giveth the ½ diurnall arch in degrees and minutes, which may be converted into time for the length of day and night time of Suns rise and Suns set.

7 By the same *data* to find the amplitude W ♑, equall to E ♋, worke *by the first of the eighth case of R.S. triangles.*

8 By the amplitude W ♑, and the difference ascentionall W C, to find the declination C ♑, worke *by the first of the third case of R.S. triangles.*

9 By the amplitude of W ♑, and the declination C ♑, to find the angle W, which is the complement of the heighth of the Pole, worke *by the first of the* 15. *case of R.S. triangles.*

10 By the declination C ♑, and complement of the poles heighth the angle W, to find the angle at ♑, which the circle of declination makes with the Horizon, worke *by the second of the* 11 *case of R.S. triangles.*

Now these five parts of this triangle may be also varied 30 severall wayes, by the same 16 cases as the former were, *viz.* the difference ascentionall may be found five wayes more, by the second varieties of the first six cases, and the amplitude five wayes more, by the seventh, eighth, ninth, and ten cases, and the declination 5 wayes more, *by the first varieties, of the first six cases,* and

and the complement of the Poles heighth five wayes more, *by the first varieties of the last six cases*, and the angle of the Meridian and Horizon five wayes more, *by the second varieties of the last 6 cases of R.S. triangles*.

Again let the triangle G R E of the schem represent the triangle ♈ R ♉ of the first case of R.S. triangles, G E R may be the East or West point, where the Æquator, Horizon and first and verticall crosse each other, G E part of the prime verticall, and G R part of the Meridian, or houre circle, passing by the place of the Sun in ♋ upon the prime verticall at G, and falling at right angles upon the Æquator in R.

11 The elevation of the pole, which is the angle at E, and the declination of the Sun G R being given, to find G E the heighth of the Sun upon the prime verticall, worke *by the second of the eighth case of R.S. triangles*.

12 By the same *data* to find R E the houre of the Suns comming, to the first verticall, worke *by the first of the fourth case of R.S. triangles*.

13 By the angle at E the heighth of the Pole, and the side G E, the heighth of the Sun upon the prime verticall, to find the declination G R. worke *by the second of the eleventh case of R. S triangles*.

14 By the houre of the Sun R E, and the declination G R, to find the angle at E, which is the heighth of the Pole, worke *by the second of the 16 case of R.S. triangles*.

15 By the heighth of the Sun upon the prime verticall G E, and the declination G R, to find the angle at G, which the Meridian makes with the prime verticall, worke *by the first of the fourteenth case of R.S. Triangles*.

Now these five parts of this triangle may be varied thirty severall wayes, as the former were, by the aforesaid 16 cases, *viz.* the heighth of the Sunne upon the first verticall five wayes more *by the seventh, eighth, ninth, and tenth cases*, the houre of the Sun comming to the prime verticall five wayes more *by the first varieties of the first six cases*, the declination five wayes more *by the second varieties of the same six cases*, the heighth of the Pole five wayes more *by the second varieties of the last six cases*, and the

angle of the Meridian, and the first verticall five wayes more *by the first varieties of the same six cases of R.S. triangles.*

Againe, let the triangle A B E of the Scheme represent the triangle ♈ R ♉, of the first case of *R.S.* triangles, and let the angle at E be the East point as afore, A E part of the houre circle of six, and A B part of the azimuth crossing the place of the Sunne in ♋ at A upon the said houre circle.

16 The angle E the heighth of the pole, and A E the declination of the Sun being given, to find A B the heighth of the Sun upon the houre circle of 6, worke *by the second of the first case of R.S. triangles,*

17 By the same *data,* to find E B the azimuth of the Sunne at the same time, worke *by the first of the second case of R.S. triangles.*

18 By the heighth of the Sun A B, and the azimuth E B, to find the declination A E: worke *by the ninth case of R.S. triangles.*

19 By the azimuth E B, and the declination E A, to find the angle E, the heighth of the Pole: worke *by the second of the 14 case of R. S. triangles.*

20 By the angle E, the heighth of the pole, & A B the heighth of the Sunne upon the houre circle of 6, to find the angle of the Suns position at A, worke *by the first of the 11 case of R.S. triangles.*

And these five parts of this triangle may be also varied 30 severall wayes by the 16 Cases aforesaid, as all other right angled triangles may be, so that the heighth of the Sunne upon the houre circle of 6 may be found five wayes more *by the second varieties of the first six cases,* the azimuth of the Sun five wayes *by the first varieties of the same six cases,* the declination five wayes more *by the seventh, eight, ninth, and tenth cases,* the heighth of the Pole five wayes more *by the second varieties of the last six cases,* and the Suns position five wayes more, *by the first varities of the same six cases of R.S. triangles.*

21 Now if you suppose Z A B to be a decliningplane, and crosse it at right angles with the Meridian P K, you have the right angle triangle Z K P, wherein the particulars desired of all declining

planes

planes are represented, for P K is the elevation of the pole above the plane, Z K the distance of the substile from the Meridian, Z P K the angle betweene the two Meridians, P Z K the complement of the declination, and P Z the complement of the heighth of the Pole of the place; But these things being at large discussed in the tenth Chapter, it were needlesse to repeat them againe, only I thought fit to remember, that these five parts of this triangle may by the 16 Cases aforesaid be varied 30 severall wayes, so that one may abundantly satisfie himselfe in all these conclusions by divers operations, and therfore the more confidently rest upon his owne worke, producing the same truth from severall *data*.

22 Againe by the same triangle P K Z, you may calculate the houre arches of the former table, for if you suppose P K to be an houre circle, and Z B the azimuth crossing it at right angles in K, the side P K, being found by the Canon annexed to the table, shall give the arch of the table desired, and by the 16 cases you may find all the other parts in that triangle if you thinke good.

23 Likewise having found by the sixt proposition the difference ascentionall E T, or W C, if you subtract it out of the right ascention of any degree of the Ecliptique in Northerne signes, you have the oblique ascention thereof, and adde it thereto, you have the oblique descention thereof, contrary, if you adde it to the right ascention of any Southerne signe, you have the oblique ascention thereof, and by subtracting it, the oblique descention of the same place.

24 The heighth of the Pole, and greatest declination being given, to find what arch of the Zodiaque never riseth or setteth in that latitude, and consequently the longest day or night of that paralell, and contrary.

When the elevation of the Pole is lesse then 66 d. 29′. the complement of the greatest declination, all the parts of the Ecliptique doe both rise and set; when just so much ♋ and ♑ cut the Horizon, when it is more part of the Ecliptique is alwayes above, and part alwayes under the Horizon; suppose 72 be the latitude neere the *North Cape* of *Finmarke* going to *Russia*, the complement thereof is 18 degrees the declination of that paralell, that never

neuer ſetteth in that latitude, the greateſt declination being given, this particular declination may be found *by the* 1 *of the* 8 *caſe of R.S. triangles*, to belong to 20 d. 45′. of ♉, or ♏ but 9 d. 15′. of ♌ and ♒ are in paralelliſme with them, therefore the arch of the Ecliptique from 20 d. 45′ of ♉ to 9 degrees 15′. of ♌ is alwayes above that Horizon, and continuall day from about the firſt of *May*, to the 23 of *Iuly* following, the contrary part of the yeare is continuall night, and of the Ecliptique never riſeth.

25 The arch of any degree of the Ecliptique, from the next Equinoctiall point, and the right aſcention thereof being given together, to find what each of them are ſeverally, ſuppoſe that aggregate be 57 degrees 54′. for ſolution of this queſtion, the greateſt difference betweene the arch of the Ecliptique and his right aſcention muſt be knowne; which you may either calculate, or find by any Table of right aſcentions to be about the middle of ♉ or ♏ 2 degrees 29′. then *by the firſt of the firſt caſe of R.S. triangles*, you ſhall find the fourth proportionall to be 2. degrees 6′. which ſubtracted from 57 degrees 54′. leaveth the double of the right aſcention, and added to the right aſcention 27 d. 54′. giveth the arch of the Ecliptique ♈ 30 d.

26 The Meridionall altitude, and declination of any knowne ſtarre that never ſetteth being given, to find the heighth of the Pole; let the Meridionall altitude of ſuch a ſtarre be N I, or N M, and the declination thereof Æ M, therefore the complement M P, or P I, to the leaſt heighth N I adde the complement of the declination I P, or from the greateſt heighth N M ſubtract the complement P M, ſo have you P N, the heigth of the pole, to be corrected by refractions if there be cauſe.

27 The right aſcention and declination of two knowne ſtars being given, whereof the one in the Horizon, the other in the Meridian, to find the heighth of the Pole without inſtrument. In the triangle P N L right angled at N, the difference of the right aſcentions of the ſtars in I and L is the angle N P L, and the complement of the declination of the ſtarre at L in the Horizon is the ſide P L: wherefore *by the ſecond of the ſecond caſe of*

of *R. S. triangles*, you may find the side P N, the heighth of the Pole desired.

Infinite are the propositions of the like kind, that might be added; which I leave the ingenious Reader in imitation of these to find out of himselfe; least varietie of conclusions, which have no bounds, should swell this Booke into a boundlesse Volume.

A

A Table of Amplitudes, for the Suns rising or setting in each degree of the Ecliptique.

♈	♎	Decli:		Amplit.		♉ ♏ Decli:		Amplit.		♊ ♐ Decli:		Amplit.	
Degrees		d	'	d	'	d	'	d	'	d	'	d	'
0	30	0	0	0	0	11	31	18	44	20	13	33	45
1	29	0	24	0	38	11	52	19	18	20	26	34	8
2	28	0	48	1	17	12	13	19	53	20	38	34	30
3	27	1	12	1	56	12	33	20	27	20	50	34	52
4	26	1	36	2	34	12	54	21	2	21	1	35	12
5	25	2	0	3	13	13	14	21	36	21	12	35	33
6	24	2	23	3	50	13	34	22	9	21	23	35	53
7	23	2	47	4	29	13	54	22	43	21	33	36	12
8	22	3	11	5	7	14	14	23	17	21	43	36	30
9	21	3	35	5	46	14	33	23	49	21	53	36	49
10	20	3	58	6	23	14	52	24	22	22	2	37	6
11	19	4	22	7	2	15	11	24	54	22	10	37	21
12	18	4	46	7	40	15	29	25	25	22	19	37	36
13	17	5	9	8	18	15	48	25	57	22	26	37	51
14	16	5	32	8	55	16	6	26	29	22	34	38	6
15	15	5	56	9	34	16	24	26	59	22	41	38	19
16	14	6	19	10	11	16	41	27	29	22	47	38	30
17	13	6	42	10	49	16	51	27	59	22	53	38	41
18	12	7	5	11	26	17	15	28	28	22	59	38	53
19	11	7	28	12	3	17	32	28	58	23	4	39	3
20	10	7	51	12	41	17	48	29	26	23	9	39	12
21	9	8	13	13	17	18	4	29	54	23	13	39	20
22	8	8	36	13	55	18	20	30	22	23	17	39	27
23	7	8	58	14	31	18	39	30	49	23	20	39	33
24	6	9	21	15	8	18	50	31	16	23	23	39	39
25	5	9	43	15	45	19	5	31	42	23	26	39	44
26	4	10	5	16	21	19	19	32	8	23	28	39	48
27	3	10	26	16	56	19	33	32	33	23	29	39	51
28	2	10	48	17	32	19	47	32	58	23	30	39	53
29	1	11	9	18	7	20	0	33	21	23	31	39	54
30	0	11	31	18	44	20	13	33	45	23	31	39	54

A Table for the Paralels proper to the latitude of 51 d. 32'.

Declina:		Amplit.		Declina:		Amplit.	
d	'	d	'	d	'	d	'
23	45	40	21	31	15	56	30
24	0	40	50	31	30	57	8
24	15	41	19	31	45	57	46
24	30	41	49	32	0	58	25
24	45	42	18	32	15	59	5
25	0	42	48	32	30	59	44
25	15	43	18	32	45	60	25
25	30	43	48	33	0	61	7
25	45	44	18	33	15	61	49
26	0	44	48	33	30	62	32
26	15	45	19	33	45	63	16
26	30	45	50	34	0	64	1
26	45	46	21	34	15	64	47
27	0	46	52	34	30	65	35
27	15	47	24	34	45	66	24
27	30	47	56	35	0	67	14
27	45	48	28	35	15	68	6
28	0	49	0	35	30	68	59
28	15	49	33	35	45	69	55
28	30	50	6	36	0	70	54
28	45	50	39	36	15	71	55
29	0	51	12	36	30	72	59
29	15	51	46	36	45	74	8
29	30	52	20	37	0	75	21
29	45	52	55	37	15	76	40
30	0	53	30	37	30	78	8
30	15	54	5	37	45	79	48
30	30	54	41	38	0	81	46
30	45	55	17	38	15	84	25
31	0	55	54	38	28	90	0

A Table originally calculated, for every fift day of the yeare, the Meridian of London, *by our Countriman, and Mathemati-*

		The Sunnes place, 1623.			Declination.		Complemet		Differ: ascenti:		½ Diurnall arches.	
		d	″	′	d	′	d	′	d	′	d	′
Ianuary.	5	25	12.	42	21	10	68	50	29	10	60	50
	10	♒ 0	18.	27	20	9	69	51	27	30	62	30
	15	5	23.	50	18	59	71	1	25	39	64	21
	20	10	28.	42	17	40	72	20	23	38	66	22
	25	15	33.	5	16	14	73	46	21	30	68	30
	30	20	36.	49	14	40	75	20	19	14	70	46
Februa:	5	26	40	19	12	40	77	20	16	26	73	34
	10	♓ 1	42	30	10	54	79	6	14	2	75	58
	15	6	43	54	9	4	80	56	11	35	78	25
	20	11	44	30	7	11	82	49	9	8	80	52
	25	16	44	14	5	15	84	45	6	38	83	22
	28	19	43	40	4	5	85	55	5	9	84	51
March.	5	24	41	56	2	7	87	53	2	39	87	21
	10	29	39	19	0	8	89	52	0	10	89	50
	15	♈ 4	35	51	1	50	88	10	2	19	92	19
	20	9	31	23	3	47	86	13	4	46	94	46
	25	14	26	4	5	43	84	17	7	14	97	14
	30	19	19	51	7	36	82	24	9	40	99	40
Aprill.	5	25	11	13	9	47	80	13	12	32	102	32
	10	29	57	6	11	30	78	30	14	50	104	50
	15	♉ 4	54	11	13	11	76	49	17	9	107	9
	20	9	44	28	14	47	75	13	19	24	109	24
	25	14	34	3	16	16	73	44	21	33	111	33
	30	19	22	57	17	38	72	22	23	35	113	35

1623. *according the place of the Sunne, corrected and rectified for*
tian of worthy memory Master Edward Wright.

		Sunrise		Sunset.		Length of day.		Length of night.		Breake of day.		Twilight	
		H.	′	H.	′	H.	′	H.	′	H.	′	H.	′
January.	5	7	57	4	3	8	6	15	54	5	50	6	10
	10	7	50	4	10	8	20	15	40	5	45	6	15
	15	7	43	4	17	8	34	15	26	5	39	6	21
	20	7	34	4	26	8	52	15	8	5	32	6	28
	25	7	26	4	34	9	8	14	52	5	25	6	35
	30	7	17	4	43	9	26	14	34	5	17	6	43
Februa:	5	7	6	4	54	9	48	14	12	5	8	6	52
	10	6	56	5	4	10	8	13	52	4	59	7	1
	15	6	46	5	14	10	28	13	32	4	50	7	10
	20	6	36	5	24	10	48	13	12	4	40	7	20
	25	6	27	5	33	11	8	12	52	4	30	7	30
	28	6	21	5	39	11	18	12	42	4	21	7	39
March.	5	6	11	5	49	11	38	12	22	4	12	7	48
	10	6	1	5	59	11	58	12	2	4	2	7	58
	15	5	51	6	9	12	18	11	42	3	50	8	10
	20	5	41	6	19	12	38	11	22	3	38	8	22
	25	5	31	6	29	12	58	11	2	3	25	8	35
	30	5	21	6	39	13	18	10	42	3	12	8	48
Aprill.	5	5	10	6	50	13	40	10	20	2	57	9	3
	10	5	1	6	59	13	58	10	2	2	41	9	19
	15	4	51	7	9	14	18	9	42	2	25	9	35
	20	4	42	7	18	14	36	9	24	2	8	9	52
	25	4	34	7	26	14	52	9	8	1	51	10	9
	30	4	26	7	34	15	8	9	52	1	32	10	28

		The Sunnes place, 1623.			Decli-nation.		Com-plement		Differ: ascenti:		½ Diurnall arches.	
		d	♉	′	d	′	d	′	d	′	d	′
May.	5	24	11	13	18	53	71	7	25	30	115	30
	10	28	58	52	20	0	70	0	27	16	117	16
	15	♊ 0	53	49	20	25	69	35	27	53	117	53
	20	3	46	1	20	59	69	1	28	52	118	52
	25	8	31	44	21	48	68	12	30	14	120	14
	30	13	19	3	22	29	67	31	31	24	121	24
		18	5	1	22	59	67	1	32	16	122	16
Iune.	5	23	47.	51	23	23	66	37	32	58	122	58
	10	28	33.	20	23	31	66	29	33	13	123	13
	15	♋ 3	18.	42	23	29	66	31	33	9	123	9
	20	8	4.	2	23	17	66	43	32	48	122	48
	25	12	49.	23	22	54	67	6	32	7	122	7
	30	17	34.	52	22	22	67	38	31	12	121	12
		22	20	30	21	40	68	20	30	0	120	0
Iuly.	5	27	6	23	20	49	69	11	28	35	118	35
	10	29	0	49	20	26	69	34	27	58	117	58
	15	♌ 1	52	34	19	49	70	11	26	58	116	58
	20	6	39	10	18	41	71	19	25	11	115	11
	25	11	26	8	17	25	72	35	23	15	113	15
	30	16	13	41	16	2	73	58	21	12	111	12
August.	5	21	59	27	14	14	75	46	18	37	108	37
	10	26	48	18	12	37	77	23	16	22	106	22
	15	♍ 1	37	52	10	56	79	4	14	4	104	4
	20	6	28	8	9	10	80	50	11	43	101	43
	25	11	19	10	7	21	82	39	9	21	99	21
	30	16	11	00	5	28	84	32	6	55	96	55

Sunrise		*Suns set*		*Length of day.*		*Length of night.*		*Breake of day.*		*Twilight*	
H	'	H.	'	H.	'	H	'	H.	'	H	'
4	18	7	42	15	24	8	36	1	8	10	52
4	11	7	49	15	38	8	22	0	37	11	23
4	8	7	52	15	44	8	16	0	11	11	49
4	5	7	55	15	50	8	10	from the twelfth of May.		Continuall day to the twelfth of Iuly.	
3	59	8	1	16	2	7	58				
3	54	8	6	16	12	7	48				
3	51	8	9	16	18	7	42	0	0		
3	48	8	12	16	24	7	36	0	0	0	0
3	47	8	13	16	26	7	34	0	0	0	0
3	47	8	13	16	26	7	34	0	0	0	0
3	49	8	11	16	22	7	38	0	0	0	0
3	52	8	8	16	16	7	44	0	0	0	0
3	55	8	5	16	10	7	50	0	0	0	0
4	0	8	0	16	0	8	0	0	0	0	0
4	6	7	54	15	48	8	12	0	0	0	0
4	8	7	52	15	44	8	16	0	10	11	50
4	12	7	48	15	36	8	24	0	44	11	16
4	19	7	41	15	22	8	38	1	13	10	47
4	27	7	33	15	6	8	54	1	35	10	25
4	35	7	25	14	50	9	10	1	54	10	5
4	46	7	14	14	28	9	32	2	15	9	45
4	55	7	5	14	10	9	50	2	31	9	29
5	4	6	56	13	52	10	8	2	46	9	14
5	13	6	47	13	34	10	26	3	0	9	0
5	23	6	37	13	14	10	46	3	14	8	46
5	32	6	28	12	56	11	4	3	28	8	32

Note that Astronomers accompt it not night, till the Sunne be 18 d. under the Horizon: and therefore we may (according to that acception) conclude it to be continuall day, from the 12 *of May to the* 12 *of July, in all which time the Sunne descendeth not so low under the Horizon.*

		The Sunnes place, 1623.				Declination.		Complement		Differ: ascenti:		Diurnall arches.	
			d	'	"	d	'	d	'	d	'	d	'
		♍											
Septem:	5		22	2	22	3	10	86	50	3	58	93	58
	10		26	56	6	1	13	88	47	1	31	91	31
	15	♎	1	50	45	0	44	89	16	0	55	89	5
	20		6	46	18	2	42	87	18	3	24	86	35
	25		11	42	45	4	39	85	21	5	53	84	7
	30		16	40	7	6	34	83	26	8	20	81	40
October.	5		21	38	25	8	28	81	32	10	48	79	12
	10		26	37	34	10	18	79	42	13	13	76	47
	15	♏	1	37	37	12	5	77	55	15	38	74	22
	20		6	38	30	13	47	76	13	17	59	72	1
	25		11	40	14	15	23	74	37	20	16	69	44
	30		16	42	43	16	53	73	7	22	29	67	31
Novem:	5		22	46.	38	18	32	71	28	24	58	65	2
	10		27	50.	36	19	45	70	15	26	52	63	8
	15	♐	2	55.	11	20	49	69	11	28	35	61	25
	20		8	0,	17	21	43	68	17	30	5	59	55
	25		13	5.	50	22	27	67	33	31	20	58	40
	30		18	11.	46	23	0	67	0	32	18	57	42
Decemb.	5		23	17	56	23	21	66	39	32	55	57	5
	10		28	24	23	23	31	66	29	33	13	56	47
	15	♑	3	30	57	23	29	66	31	33	9	56	51
	20		8	37	31	23	15	66	45	32	44	57	16
	25		13	44	4	22	49	67	11	31	58	58	2
	30		18	50	26	22	12	67	48	30	54	59	6

N	Logarithmi	Differ.	N	Logarithmi	Differ.
1	0,00000,00000		31	1,49136,16938	1378,82845
2	0,30102,99957	17609, 12590	32	1,50514,99783	1336,39616
3	0,47712,12547	12493, 87366	33	1,51851,39399	1296,49771
4	0,60205,99913	9691,00130	34	1,53147,89170	1258,91274
5	0,69897,00043	7918,12461	35	1,54406,80444	1223,44564
6	0,77815,12504	6694,67896	36	1,55630,25008	1189,92233
7	0,84509,80400	5799,19470	37	1,56820,17241	1158,18725
8	0,90308,99870	5115,25224	38	1,57978,35966	1128,10104
9	0,95424,25094	4575,74906	39	1,59106,46070	1099,53843
10	1,00000,00000	4139,26852	40	1,60205,99913	1072,38654
11	1,04139,26852	3778,85608	41	1,61278,38567	1046,54337
12	1,07918,12460	3476,21063	42	1,62324,92904	1021,91652
13	1,11394,33523	3218,46834	43	1,63346,84556	998,42209
14	1,14612,80357	2996,32234	44	1,64345,26765	975,98373
15	1,17609,12591	2802,87236	45	1,65321,25138	954,53179
16	1,20411,99827	2632,89387	46	1,66275,78317	934,00262
17	1,23044,89214	2482,35837	47	1,67209,78579	914,33795
18	1,25527,25051	2348,10959	48	1,68124,12374	895,48426
19	1,27875,36010	2227,63947	49	1,69019,60800	877,39243
20	1,30102,99957	2118,92990	50	1,69897,00043	860,01718
21	1,32221,92947	2020,33861	51	1,70757,01761	843,31675
22	1,34242,26808	1930,51552	52	1,71600,33436	827,25260
23	1,36172,78360	1848,34057	53	1,72427,58696	811,78902
24	1,38021,12417	1772,87670	54	1,73239,37598	796,89297
25	1,39794,00087	1703,33393	55	1,74036,26895	782,53375
26	1,41497,33480	1639,04162	56	1,74818,80270	768,68287
27	1,43136,37642	1579,42671	57	1,75587,48557	755,31379
28	1,44715,80313	1523,99666	58	1,76342,79936	742,40180
29	1,46239,79979	1472,32568	59	1,77085,20116	729,92388
30	1,47712,12547	1424,04391	60	1,77815,12504	717,85846

N.	Logarithmi	Differ.
61	1,78532,98350	706,18545
62	1,79239,16895	694,88600
63	1,79934,05495	683,94245
64	1,80617,99740	673,33826
65	1,81291,33566	663,05789
66	1,81954,39355	653,08672
67	1,82607,48027	643,41100
68	1,83250,89127	634,01780
69	1,83884,90907	624,89493
70	1,84509,80400	616,03087
71	1,85125,83487	607,41477
72	1,85733,24964	599,03637
73	1,86332,28601	590,88596
74	1,86923,17197	582,95437
75	1,87506,12634	575,23289
76	1,88081,35923	567,71329
77	1,88649,07252	560,38775
78	1,89209,46027	553,24886
79	1,89762,70913	546,28957
80	1,90308,93870	539,50319
81	1,90848,50189	532,88335
82	1,91381,38524	526,42400
83	1,91907,80924	520,11937
84	1,92427,92861	513,96396
85	1,92941,89257	507,95255
86	1,93449,84512	502,08014
87	1,93951,92526	496,34196
88	1,94448,26722	490,73344
89	1,94939,00066	485,25028
90	1,95424,25094	479,88829
91	1,95904,13923	474,64350
92	1,96378,78273	469,51213
93	1,96848,29486	464,49050
94	1,97312,78536	459,57517
95	1,97772,36053	454,76277
96	1,98227,12330	450,05013
97	1,98677,17343	445,43414
98	1,99122,60757	440,91189
99	1,99563,51946	436,48054
100	2,00000,00000	432,13738
101	2,00432,13738	427,87980
102	2,00860,01718	423,70529
103	2,01283,72247	419,61146
104	2,01703,33393	415,59598
105	2,02118,92991	411,65662
106	2,02530,58653	407,79124
107	2,02938,37777	403,99778
108	2,03342,37555	400,27424
109	2,03742,64979	396,61873
110	2,04139,26852	393,02936
111	2,04532,29788	389,50439
112	2,04921,80227	386,04208
113	2,05307,84435	382,64078
114	2,05690,48513	379,29891
115	2,06069,78404	376,01488
116	2,06445,79892	372,78725
117	2,06818,58617	369,61456
118	2,07188,20073	366,49541
119	2,07554,69614	363,42846
120	2,07918,12460	360,41243

N.	Lo[illegible]
121	2,08[illegible]
122	2,08[illegible]
123	2,08[illegible]
124	2,09[illegible]
125	2,09[illegible]
126	2,1[illegible]
127	2,1[illegible]
128	2,1[illegible]
129	2,1[illegible]
130	2,[illegible]
131	2,[illegible]
132	2,[illegible]
133	2[illegible]
134	2[illegible]
135	[illegible]
136	[illegible]
137	[illegible]
138	[illegible]
139	[illegible]
140	[illegible]

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
121	2,08278,53703	357,44604	151	2,17897,69473	286,66406
122	2,08635,98307	354,52807	152	2,18184,35879	284,78429
123	2,08990,51114	351,65738	153	2,18469,14308	282,92900
124	2,09342,16852	348,83278	154	2,18752,07208	281,09774
125	2,09691,00130	346,05321	155	2,19033,16982	279,29002
126	2,10037,05451	343,31759	156	2,19312,45984	277,50540
127	2,10380,37210	340,62486	157	2,19589,96524	275,74346
128	2,10720,99696	337,97407	158	2,19865,70870	274,00373
129	2,11058,97103	335,36420	159	2,20139,71243	272,28584
130	2,11394,33523	332,79434	160	2,20411,99827	270,58933
131	2,11727,12957	330,26355	161	2,20682,58760	268,91385
132	2,12057,39312	327,77098	162	2,20951,50145	267,25899
133	2,12385,16410	325,31574	163	2,21218,76044	265,62436
134	2,12710,47984	322,89701	164	2,21484,38480	264,00962
135	2,13033,37685	320,51399	165	2,21748,39442	262,41438
136	2,13353,89084	318,16588	166	2,22010,80880	260,83831
137	2,13672,05672	315,85192	167	2,22271,64711	259,28106
138	2,13987,90864	313,57139	168	2,22530,92817	257,74229
139	2,14301,48003	311,32354	169	2,22788,67046	256,22168
140	2,14612,80357	309,10770	170	2,23044,89214	254,71890
141	2,14921,91127	306,92317	171	2,23299,61104	253,23365
142	2,15228,83444	304,76931	172	2,23552,84469	251,76562
143	2,15533,60375	302,64546	173	2,23804,61031	250,31452
144	2,15836,24921	300,55101	174	2,24054,92483	248,88004
145	2,16136,80022	298,48536	175	2,24303,80487	247,46191
146	2,16435,28558	296,44789	176	2,24551,26678	246,05986
147	2,16731,73347	294,43807	177	2,24797,32664	244,67359
148	2,17026,17154	292,45530	178	2,25042,00023	243,30287
149	2,17318,62684	290,49907	179	2,25285,30310	241,94741
150	2,17609,12591	288,56882	180	2,25527,25051	240,60698

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
181	2,25767,85749	239,28131	211	2,32428,24553	205,34056
182	2,26007,13880	237,97017	212	2,32633,58609	204,37425
183	2,26245,10897	236,67333	213	2,32837,96034	203,41699
184	2,26481,78230	235,39054	214	2,33041,37733	202,46866
185	2,26717,17284	234,12158	215	2,33243,84599	201,52913
186	2,26951,29442	232,86623	216	2,33445,37512	200,59826
187	2,27184,16065	231,62428	217	2,33645,97338	199,67598
188	2,27415,78493	230,39549	218	2,33845,64936	198,76212
189	2,27646,18042	229,17968	219	2,34044,41148	197,85660
190	2,27875,36010	227,97662	220	2,34242,26808	196,95929
191	2,28103,33672	226,78615	221	2,34439,22737	196,07008
192	2,28330,12287	225,60803	222	2,34635,29745	195,18885
193	2,28555,73090	224,44209	223	2,34830,48630	194,31553
194	2,28780,17299	223,28815	224	2,35024,80183	193,44998
195	2,29003,46114	222,14600	225	2,35218,25181	192,59210
196	2,29225,60714	221,01548	226	2,35410,84391	191,74181
197	2,29446,62262	219,89641	227	2,35602,58572	190,89898
198	2,29666,51903	218,78861	228	2,35793,48470	190,06353
199	2,29885,30764	217,69193	229	2,35983,54823	189,23537
200	2,30102,99957	216,60617	230	2,36172,78360	188,41439
201	2,30319,60574	215,53120	231	2,36361,19799	187,60050
202	2,30535,13694	214,46685	232	2,36548,79849	186,79361
203	2,30749,60379	213,41295	233	2,36735,59210	185,99364
204	2,30963,01674	212,36937	234	2,36921,58574	185,20049
205	2,31175,38611	211,33593	235	2,37106,78623	184,41407
206	2,31386,72204	210,31251	236	2,37291,20030	183,63430
207	2,31597,03455	209,29895	237	2,37474,83460	182,86111
208	2,31806,33350	208,29511	238	2,37657,69571	182,09438
209	2,32014,62861	207,30086	239	2,37839,79009	181,33408
210	2,32221,92947	206,31606	240	2,38021,12417	180,58009

240

N.	Logarithmi	Differ.
241	2,38201,70426	179,83234
242	2,38381,53660	179,09076
243	2,38560,62736	178,35527
244	2,38738,98263	177,62581
245	2,38916,60844	176,90227
246	2,39093,51071	176,18462
247	2,39269,69533	175,47275
248	2,39445,16808	174,76663
249	2,39619,93471	174,06616
250	2,39794,00087	173,37128
251	2,39967,37215	172,68193
252	2,40140,05408	171,99804
253	2,40312,05212	171,31954
254	2,40483,37166	170,64638
255	2,40654,01804	169,97849
256	2,40823,99653	169,31580
257	2,40993,31233	168,65827
258	2,41161,97060	168,00581
259	2,41329,97641	167,35839
260	2,41497,33480	166,71593
261	2,41664,05073	166,07840
262	2,41830,12913	165,44572
263	2,41995,57485	164,81784
264	2,42160,39269	164,19470
265	2,42324,58739	163,57627
266	2,42488,16366	162,96248
267	2,42651,12614	162,35326
268	2,42813,47940	161,74860
269	2,42975,22800	161,14842
270	2,43136,37642	160,55267

N.	Logarithmi	Differ.
271	2,43296,92909	159,96131
272	2,43456,89040	159,37430
273	2,43616,26470	158,79158
274	2,43775,05628	158,21310
275	2,43933,26938	157,63883
276	2,44090,90821	157,06870
277	2,44247,97691	156,50268
278	2,44404,47959	155,94074
279	2,44560,42033	155,38280
280	2,44715,80313	154,82886
281	2,44870,63199	154,27884
282	2,45024,91083	153,73272
283	2,45178,64355	153,19045
284	2,45331,83400	152,65200
285	2,45484,48600	152,11731
286	2,45636,60331	151,58636
287	2,45788,18967	151,05911
288	2,45939,24878	150,53550
289	2,46089,78428	150,01551
290	2,46239,79979	149,49911
291	2,46389,29890	148,98624
292	2,46538,28514	148,47690
293	2,46686,76204	147,97100
294	2,46834,73304	147,46856
295	2,46982,20160	146,96951
296	2,47129,17111	146,4738-
297	2,47275,64493	145,98148
298	2,47421,62641	145,49242
299	2,47567,11883	145,00664
300	2,47712,12547	144,52409

241

301

N.	Logarithmi	Differ.
301	2,47856,64956	144,04474
302	2,48000,69430	143,56855
303	2,48144,26285	143,09551
304	2,48287,35836	142,62557
305	2,48429,98393	142,15872
306	2,48572,14265	141,69490
307	2,48713,83755	141,23410
308	2,48855,07165	140,77629
309	2,48995,84794	140,32144
310	2,49136,16938	139,86952
311	2,49276,03890	139,42050
312	2,49415,45940	138,97435
313	2,49554,43375	138,53106
314	2,49692,96481	138,09057
315	2,49831,05538	137,65288
316	2,49968,70826	137,21796
317	2,50105,92622	136,78578
318	2,50242,71200	136,35631
319	2,50379,06831	135,92952
320	2,50514,99783	135,50541
321	2,50650,50324	135,08393
322	2,50785,58717	134,66506
323	2,50920,25223	134,24879
324	2,51054,50102	133,83508
325	2,51188,33610	133,42391
326	2,51321,76001	133,01526
327	2,51454,77527	132,60910
328	2,51587,38437	132,20542
329	2,51719,58979	131,80420
330	2,51851,39399	131,40539

N.	Logarithmi	Differ.
331	2,51982,79938	131,00899
332	2,52113,80837	130,61498
333	2,52244,42335	130,22333
334	2,52374,64668	129,83402
335	2,52504,48070	129,44704
336	2,52633,92774	129,06235
337	2,52762,99009	128,67994
338	2,52891,67003	128,29979
339	2,53019,96982	127,92188
340	2,53147,89170	127,54020
341	2,53275,43790	127,17271
342	2,53402,61061	126,80139
343	2,53529,41200	126,43226
344	2,53655,84426	126,06525
345	2,53781,90951	125,70037
346	2,53907,60988	125,33760
347	2,54032,94748	124,97691
348	2,54157,92439	124,61831
349	2,54282,54270	124,26174
350	2,54406,80444	123,90721
351	2,54530,71165	123,55470
352	2,54654,26635	123,20419
353	2,54777,47054	122,85566
354	2,54900,32620	122,50911
355	2,55022,83531	122,16449
356	2,55144,99980	121,82181
357	2,55266,82161	121,48105
358	2,55388,30266	121,14220
359	2,55509,44486	120,80522
360	2,55630,25008	120,47011

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
361	2,55750,72019	120,13686	391	2,59217,67574	110,93096
362	2,55870,85705	119,80545	392	2,59328,60670	110,64834
363	2,55990,66250	119,47586	393	2,59439,25504	110,36714
364	2,56110,13836	119,14809	394	2,59549,62218	110,08738
365	2,56229,28645	118,82209	395	2,59659,70956	109,80903
366	2,56348,10854	118,49789	396	2,59769,51859	109,53209
367	2,56466,60643	118,17544	397	2,59879,05068	109,25653
368	2,56584,78187	117,85475	398	2,59988,30721	108,98236
369	2,56702,63662	117,53579	399	2,60097,28957	108,70956
370	2,56820,17241	117,21855	400	2,60205,99913	108,43813
371	2,56937,39096	116,90303	401	2,60314,43726	108,16805
372	2,57054,29399	116,58919	402	2,60422,60531	107,89930
373	2,57170,88318	116,27704	403	2,60530,50461	107,63190
374	2,57287,16022	115,96655	404	2,60638,13651	107,36581
375	2,57403,12677	115,65772	405	2,60745,50232	107,10104
376	2,57518,78449	115,35053	406	2,60852,60336	106,83756
377	2,57634,13502	115,04496	407	2,60959,44092	106,57539
378	2,57749,17998	114,74102	408	2,61066,01631	106,31449
379	2,57863,92100	114,43866	409	2,61172,33080	106,05487
380	2,57978,35966	114,13791	410	2,61278,38567	105,79652
381	2,58092,49757	113,83872	411	2,61384,18219	105,53941
382	2,58206,33629	113,54111	412	2,61489,72160	105,28357
383	2,58319,87740	113,24504	413	2,61595,00517	105,02894
384	2,58433,12244	112,95051	414	2,61700,03411	104,77556
385	2,58546,07295	112,65752	415	2,61804,80967	104,52339
386	2,58658,73047	112,36603	416	2,61909,33306	104,27244
387	2,58771,09650	112,07606	417	2,62013,60550	104,02268
388	2,58883,17256	111,78757	418	2,62117,62818	103,77412
389	2,58994,96013	111,50057	419	2,62221,40230	103,52674
390	2,59106,46070	111,21504	420	2,62324,92904	103,28054

N.	Logarithmi	Differ.	Nu.	Logarithmi	Differ.
421	2,62428,20958	103,03552	451	2,65417,65419	96,18929
422	2,62531,24510	102,79164	452	2,65513,84348	95,97672
423	2,62634,03674	102,54892	453	2,65609,82020	95,76509
424	2,62736,58566	102,30735	454	2,65705,58529	95,55438
425	2,62838,89301	102,06690	455	2,65801,13967	95,34460
426	2,62940,95991	101,82759	456	2,65896,48427	95,13574
427	2,63042,78750	101,58940	457	2,65991,62001	94,92779
428	2,63144,37690	101,35232	458	2,66086,54780	94,72075
429	2,63245,72922	101,11634	459	2,66181,26855	94,51462
430	2,63346,84556	100,88146	460	2,66275,78317	94,30937
431	2,63447,72702	100,64766	461	2,66370,09254	94,10502
432	2,63548,37468	100,41496	462	2,66464,19756	93,90154
433	2,63648,78964	100,18331	463	2,66558,09910	93,69896
434	2,63748,97295	99,95275	464	2,66651,79806	93,49723
435	2,63848,92570	99,72323	465	2,66745,29529	93,29638
436	2,63948,64893	99,49477	466	2,66838,59167	93,09639
437	2,64048,14370	99,26735	467	2,66931,68806	92,89725
438	2,64147,41105	99,04097	468	2,67024,58531	92,69896
439	2,64246,45202	98,81563	469	2,67117,28427	92,50152
440	2,64345,26765	98,59130	470	2,67209,78579	92,30492
441	2,64443,85895	98,36798	471	2,67302,09071	92,10915
442	2,64542,22693	98,14569	472	2,67394,19986	91,91421
443	2,64640,37262	97,92439	473	2,67486,11407	91,72010
444	2,64738,29701	97,70409	474	2,67577,83417	91,52679
445	2,64836,00110	97,48477	475	2,67669,36096	91,33431
446	2,64933,48587	97,26644	476	2,67760,69527	91,14263
448	2,65030,75231	97,04909	477	2,67851,83790	90,95176
447	2,65127,80140	96,83270	478	2,67942,78966	90,76168
449	2,65224,63410	96,61728	479	2,68033,55134	90,57240
450	2,65321,25138	96,40281	480	2,68124,12374	90,38390

N.	Logarithmi	Differ.
481	2,68214,50764	90,19618
482	2,68304,70382	90,00926
483	2,68394,71308	89,82308
484	2,68484,53616	89,63770
485	2,68574,17386	89,45307
486	2,68663,62693	89,26919
487	2,68752,89612	89,08608
488	2,68841,98220	88,90371
489	2,68930,88591	88,72209
490	2,69019,60800	88,54121
491	2,69108,14921	88,36107
492	2,69196,51028	88,18165
493	2,69284,69193	88,00296
494	2,69372,69489	87,82500
495	2,69460,51989	87,64776
496	2,69548,16765	87,47122
497	2,69635,63887	87,29541
498	2,69722,93428	87,12028
499	2,69810,05456	86,94587
500	2,69897,00043	86,77216
501	2,69983,77259	86,59912
502	2,70070,37171	86,42680
503	2,70156,79851	86,25513
504	2,70243,05364	86,08417
505	2,70329,13781	85,91387
506	2,70415,05168	85,74425
507	2,70500,79593	85,57530
508	2,70586,37123	85,40700
509	2,70671,77823	85,23938
510	2,70757,01761	85,07240

N.	Logarithmi	Differ.
511	2,70842,09001	84,90609
512	2,70926,99610	84,74041
513	2,71011,73651	84,57539
514	2,71096,31190	84,41100
515	2,71180,72290	84,24726
516	2,71264,97016	84,08415
517	2,71349,05431	83,92166
518	2,71432,97597	83,75981
519	2,71516,73578	83,59858
520	2,71600,33436	83,43797
521	2,71683,77233	83,27797
522	2,71767,05030	83,11859
523	2,71850,16889	82,95981
524	2,71933,12870	82,80164
525	2,72015,93034	82,64408
526	2,72098,57442	82,48710
527	2,72181,06152	82,33073
528	2,72263,39225	82,17495
529	2,72345,56720	82,01976
530	2,72427,58696	81,86515
531	2,72509,45211	81,71112
532	2,72591,16323	81,55767
533	2,72672,72090	81,40480
534	2,72754,12570	81,25250
535	2,72835,37820	81,10077
536	2,72916,47897	80,94960
537	2,72997,42857	80,79900
538	2,73078,22757	80,64895
539	2,73158,87652	80,49946
540	2,73239,37598	80,35053

540

N.	Logarithmi	Differ.
541	2,73319,72651	80,20214
542	2,73399,92865	80,05431
543	2,73479,98296	79,90701
544	2,73559,88997	79,76026
545	2,73639,65023	79,61404
546	2,73719,26427	79,46836
547	2,73798,73263	79,32322
548	2,73878,05585	79,17860
549	2,73957,23445	79,03450
550	2,74036,26895	78,89094
551	2,74115,15989	78,74788
552	2,74193,90777	78,60536
553	2,74272,51313	78,46334
554	2,74350,97647	78,32184
555	2,74429,29831	78,18085
556	2,74507,47916	78,04036
557	2,74585,51952	77,90038
558	2,74663,41990	77,76089
559	2,74741,18079	77,62191
560	2,74818,80270	77,48343
561	2,74896,28613	77,34543
562	2,74973,63156	77,20793
563	2,75050,83949	77,07091
564	2,75127,91040	76,93438
565	2,75204,84478	76,79834
566	2,75281,64312	76,66277
567	2,75358,30589	76,52768
568	2,75434,83357	76,39307
569	2,75511,22664	76,25893
570	2,75587,48557	76,12525

570

N.	Logarithmi	Differ.
571	2,75663,61082	75,99206
572	2,75739,60288	75,85932
573	2,75815,46220	75,72704
574	2,75891,18924	75,59523
575	2,75966,78447	75,46387
576	2,76042,24834	75,33298
577	2,76117,58132	75,20252
578	2,76192,78384	75,07253
579	2,76267,85637	74,94299
580	2,76342,79936	74,81388
581	2,76417,61324	74,68522
582	2,76492,29846	74,55702
583	2,76566,85548	74,42923
584	2,76641,28471	74,30190
585	2,76715,58661	74,17499
586	2,76789,76160	74,04852
587	2,76863,81012	73,92249
588	2,76937,73261	73,79687
589	2,77011,52948	73,67168
590	2,77085,20116	73,54693
591	2,77158,74809	73,42258
592	2,77232,17067	73,29867
593	2,77305,46934	73,17516
594	2,77378,64450	73,05207
595	2,77451,69657	72,92940
596	2,77524,62597	72,80714
597	2,77597,43311	72,68529
598	2,77670,11840	72,56384
599	2,77742,68224	72,44280
600	2,77815,12504	72,32216

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
601	2,77887,44720	72,20193	631	2,80002,93592	68,77191
602	2,77959,64913	72,08208	632	2,80071,70783	68,66317
603	2,78031,73121	71,96265	633	2,80140,37100	68,55479
604	2,78103,69386	71,84361	634	2,80208,92579	68,44674
605	2,78175,53747	71,72495	635	2,80277,37253	68,33903
606	2,78247,26242	71,60669	636	2,80345,71156	68,23167
607	2,78318,86911	71,48882	637	2,80413,94323	68,12464
608	2,78390,35793	71,37133	638	2,80482,06787	68,01795
609	2,78461,72926	71,25424	639	2,80550,08582	67,91158
610	2,78532,98350	71,13752	640	2,80617,99740	67,80555
611	2,78604,12102	71,02119	641	2,80685,80295	67,69986
612	2,78675,14221	70,90524	642	2,80753,50281	67,59448
613	2,78746,04745	70,78966	643	2,80821,09729	67,48945
614	2,78816,83711	70,67447	644	2,80888,58674	67,38472
615	2,78887,51158	70,55964	645	2,80955,97146	67,28034
616	2,78958,07122	70,44518	646	2,81023,25180	67,17627
617	2,79028,51640	70,33111	647	2,81090,42807	67,07252
618	2,79098,84751	70,21739	648	2,81157,50059	66,96909
619	2,79169,06490	70,10405	649	2,81224,46968	66,86598
620	2,79239,16895	69,99107	650	2,81291,33566	66,76320
621	2,79309,16002	69,87845	651	2,81358,09886	66,66071
622	2,79379,03847	69,76620	652	2,81424,75957	66,55856
623	2,79448,80467	69,65430	653	2,81491,31813	66,45670
624	2,79518,45897	69,54276	654	2,81557,77483	66,35517
625	2,79588,00173	69,43159	655	2,81624,13000	66,25394
626	2,79657,43332	69,32076	656	2,81690,38394	66,15302
627	2,79726,75408	69,21029	657	2,81756,53696	66,05240
628	2,79795,96437	69,10017	658	2,81822,58936	65,95210
629	2,79865,06454	68,99041	659	2,81888,54146	65,85209
630	2,79934,05495	68,88097	660	2,81954,39355	65,75240

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
661	2,82020,14595	65,65299	691	2,83947,80474	62,80471
662	2,82085,79894	65,55390	692	2,84010,60945	62,71401
663	2,82151,35284	65,45510	693	2,84073,32346	62,62359
664	2,82216,80794	65,35659	694	2,84135,94705	62,53341
665	2,82282,16453	65,25839	695	2,84198,48046	62,44350
666	2,82347,42292	65,16047	696	2,84260,92396	62,35385
667	2,82412,58339	65,06286	697	2,84323,27781	62,26445
668	2,82477,64625	64,96553	698	2,84385,54226	62,17531
669	2,82542,61178	64,86849	699	2,84447,71757	62,08643
670	2,82607,48027	64,77175	700	2,84509,80400	61,99780
671	2,82672,25202	64,67529	701	2,84571,80180	61,90941
672	2,82736,92731	64,57911	702	2,84633,71121	61,82129
673	2,82801,50642	64,48323	703	2,84695,53250	61,73341
674	2,82865,98965	64,38763	704	2,84757,26591	61,64579
675	2,82930,37728	64,29231	705	2,84818,91170	61,55841
676	2,82994,66959	64,19728	706	2,84880,47011	61,47127
677	2,83058,86687	64,10252	707	2,84941,94138	61,38439
678	2,83122,96939	64,00804	708	2,85003,32577	61,29775
679	2,83186,97743	63,91384	709	2,85064,62352	61,21135
680	2,83250,89127	63,81992	710	2,85125,83487	61,12520
681	2,83314,71119	63,72628	711	2,85186,96007	61,03929
682	2,83378,43747	63,63290	712	2,85247,99936	60,95363
683	2,83442,07037	63,53980	713	2,85308,95299	60,86819
684	2,83505,61017	63,44698	714	2,85369,82118	60,78300
685	2,83569,05715	63,35442	715	2,85430,60418	60,69805
686	2,83632,41157	63,26214	716	2,85491,30223	60,61334
687	2,83695,67371	63,17011	717	2,85551,91557	60,52885
688	2,83758,84382	63,07837	718	2,85612,44442	60,44462
689	2,83821,92219	62,98688	719	2,85672,88904	60,36060
690	2,83884,90907	62,89567	720	2,85733,24964	60,27683

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
721	2,85793,52647	60,19329	751	2,87563,99370	57,79036
722	2,85853,71976	60,10997	752	2,87621,78406	57,71356
723	2,85913,82973	60,02689	753	2,87679,49762	57,63697
724	2,85973,85662	59,94404	754	2,87737,13459	57,56057
725	2,86033,80066	59,86141	755	2,87794,69516	57,48439
726	2,86093,66207	59,77902	756	2,87852,17955	57,40840
727	2,86153,44109	59,69684	757	2,87909,58795	57,33261
728	2,86213,13793	59,61490	758	2,87966,92056	57,25703
729	2,86272,75283	59,53318	759	2,88024,17759	57,18164
730	2,86332,28601	59,45169	760	2,88081,35923	57,10645
731	2,86391,73770	59,37041	761	2,88138,46568	57,03145
732	2,86451,10811	59,28935	762	2,88195,49713	56,95667
733	2,86510,39746	59,20853	763	2,88252,45380	56,88206
734	2,86569,60599	59,12792	764	2,88309,33586	56,80766
735	2,86628,73391	59,04752	765	2,88366,14352	56,73344
736	2,86687,78143	58,96736	766	2,88422,87696	56,65943
737	2,86746,74879	58,88739	767	2,88479,53639	56,58561
738	2,86805,63618	58,80766	768	2,88536,12200	56,51198
739	2,86864,44384	58,72813	769	2,88592,63398	56,43854
740	2,86923,17197	58,64883	770	2,88649,07252	56,36529
741	2,86981,82080	58,56973	771	2,88705,43781	56,29222
742	2,87040,39053	58,49085	772	2,88761,73003	56,21936
743	2,87098,88138	58,41217	773	2,88817,94939	56,14668
744	2,87157,29355	58,33372	774	2,88874,09607	56,07418
745	2,87215,62727	58,25548	775	2,88930,17025	56,00188
746	2,87273,88275	58,17743	776	2,88986,17213	55,92975
747	2,87332,06018	58,09961	777	2,89042,10188	55,85782
748	2,87390,15979	58,02198	778	2,89097,95970	55,78207
749	2,87448,18177	57,94457	779	2,89153,74577	55,71450
750	2,87506,12634	57,86736	780	2,89209,46027	55,64312

N.	Logarithmi	Differ.
781	2,89265,10339	55,57192
782	2,89320,67531	55,50090
783	2,89376,17621	55,43006
784	2,89431,60627	55,35940
785	2,89486,96567	55,28893
786	2,89542,25460	55,21864
787	2,89597,47324	55,14851
788	2,89652,62175	55,07857
789	2,89707,70032	55,00881
790	2,89762,70913	54,93922
791	2,89817,64835	54,86981
792	2,89872,51816	54,80057
793	2,89927,31873	54,73151
794	2,89982,05024	54,66263
795	2,90036,71287	54,59390
796	2,90091,30677	54,52537
797	2,90145,83214	54,45700
798	2,90200,28914	54,38879
799	2,90254,67793	54,32077
800	2,90308,99870	54,25291
801	2,90363,25161	54,18522
802	2,90417,43683	54,11770
803	2,90471,55453	54,05034
804	2,90525,60487	53,98317
805	2,90579,58804	53,91614
806	2,90633,50418	53,84929
807	2,90687,35347	53,78261
808	2,90741,13608	53,71608
809	2,90794,85216	53,64973
810	2,90848,50189	53,58353

N.	Logarithmi	Differ.
811	2,90902,08542	53,51750
812	2,90955,60292	53,45164
813	2,91009,05456	53,38593
814	2,91062,44049	53,32038
815	2,91115,76087	53,25501
816	2,91169,01588	53,18977
817	2,91222,20565	53,12472
818	2,91275,33037	53,05981
819	2,91328,39018	52,99506
820	2,91381,38524	52,93047
821	2,91434,31571	52,86604
822	2,91487,18175	52,80177
823	2,91539,98352	52,73765
824	2,91592,72117	52,67368
825	2,91645,39485	52,60988
826	2,91698,00473	52,54623
827	2,91750,55096	52,48272
828	2,91803,03368	52,41938
829	2,91855,45306	52,35618
830	2,91907,80924	52,29314
831	2,91960,10238	52,23025
832	2,92012,33263	52,16751
833	2,92064,50014	52,10492
834	2,92116,60506	52,04249
835	2,92168,64755	51,98019
836	2,92220,62774	51,91806
837	2,92272,54580	51,85606
838	2,92324,40186	51,79422
839	2,92376,19608	51,73253
840	2,92427,92861	51,67097

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
841	2,92479,59958	51,60957	871	2,94001,81550	49,83299
842	2,92531,20915	51,54831	872	2,94051,64849	49,77588
843	2,92582,75746	51,48720	873	2,94101,42437	49,71889
844	2,92634,24466	51,42623	874	2,94151,14326	49,66204
845	2,92685,67089	51,36541	875	2,94200,80530	49,60532
846	2,92737,03630	51,30473	876	2,94250,41062	49,54872
847	2,92788,34103	51,24420	877	2,94299,95934	49,49225
848	2,92839,58523	51,18379	878	2,94349,45159	49,43592
849	2,92890,76902	51,12355	879	2,94398,88751	49,37971
850	2,92941,89257	51,06344	880	2,94448,26722	49,32362
851	2,92992,95601	51,00347	881	2,94497,59084	49,26767
852	2,93043,95948	50,94364	882	2,94546,85851	49,21185
853	2,93094,90312	50,88395	883	2,94596,07036	49,15614
854	2,93145,78707	50,82440	884	2,94645,22650	49,10057
855	2,93196,61147	50,76500	885	2,94694,32707	49,04512
856	2,93247,37647	50,70572	886	2,94743,37219	48,98979
857	2,93298,08219	50,64659	887	2,94792,36198	48,93460
858	2,93348,72878	50,58760	888	2,94841,29658	48,87952
859	2,93399,31638	50,52874	889	2,94890,17610	48,82456
860	2,93449,84512	50,47003	890	2,94939,00066	48,76974
861	2,93500,31515	50,41143	891	2,94987,77040	48,71504
862	2,93550,72658	50,35299	892	2,95036,48544	48,66045
863	2,93601,07957	50,29468	893	2,95085,14589	48,60599
864	2,93651,37425	50,23650	894	2,95133,75188	48,55165
865	2,93701,61075	50,17845	895	2,95182,30353	48,49744
866	2,93751,78920	50,12055	896	2,95230,80097	48,44333
867	2,93801,90975	50,06277	897	2,95279,24430	48,38937
868	2,93851,97252	50,00512	898	2,95327,63367	48,33550
869	2,93901,97764	49,94762	899	2,95375,96917	48,28177
870	2,93951,92526	49,89024	900	2,95424,25094	48,22816

N.	Logarithmi	Differ.
901	2,95472,47910	48,17465
902	2.95520,65375	48,12128
903	2,95568,77503	48,06802
904	2,95616,84305	48,01487
905	2,95664,85792	47,96185
906	2,95712,81977	47,90894
907	2,95760,72871	47,85614
908	2,95808,58485	47,80347
909	2,95856,38832	47,75091
910	2,95904,13923	47,69847
911	2,95951,83770	47,64613
912	2,95999,48383	47,59392
913	2,96047,07775	47,54182
914	2,96094,61957	47,48984
915	2,96142,10941	47,43796
916	2,96189,54737	47,38620
917	2,96236,93357	47,33455
918	2,96284,26812	47,28302
919	2,96331,55114	47,23159
920	2,96378,78273	47,18029
921	2,96425,96302	47,12909
922	2,96473,09211	47,07799
923	2,96520,17010	47,02702
924	2,96567,19712	46,97615
925	2,96614,17327	46,92540
926	2,96661,09867	46,87474
927	2,96707,97341	46,82421
928	2,96754,79762	46,77378
929	2,96801,57140	46,72346
930	2,95848,29486	46,67324

N.	Logarithmi	Differ.
931	2,96894,96810	46,62314
932	2,96941,59124	46,57313
933	2,96988,16437	46,52325
934	2,97034,68762	46,47347
935	2,97081,16109	46,42378
936	2,97127,58487	46,37422
937	2,97173,95909	46,32475
938	2,97220,28384	46,27539
939	2,97266,55923	46,22613
940	2,97312,78536	46,17698
941	2,97358,96234	46,12794
942	2,97405,09028	46,07899
943	2,97451,16927	46,03016
944	2,97497,19943	45,98142
945	2,97543,18085	45,93279
946	2,97589,11364	45,88426
947	2,97634,99790	45,83583
948	2,97680,83373	45,78751
949	2,97726,62124	45,73929
950	2,97772,36053	45,69116
951	2,97818,05169	45,64315
952	2,97863,69484	45,59522
953	2,97909,29006	45,54741
954	2,97954,83747	45,49969
955	2,98000,33716	45,45207
956	2,98045,78923	45,40455
957	2,98091,19378	45,35713
958	2,98136,55091	45,30981
959	2,98181,86072	45,26258
960	2,98227,12330	45,21547

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
961	2,98272,33877	45,16843	991	2,99607,36545	43,80177
962	2,98317,50720	45,12151	992	2,99651,16722	43,75763
963	2,98362,62871	45,07468	993	2,99694,92485	43,71359
964	2,98407,70339	45,02794	994	2,99738,63844	43,66963
965	2,98452,73133	44,98131	995	2,99782,30807	43,62577
966	2,98497,71264	44,93477	996	2,99825,93384	43,58199
967	2,98542,64741	44,88832	997	2,99869,51583	43,53830
968	2,98587,53573	44,84198	998	2,99913,05413	43,49469
969	2,98632,37771	44,79572	999	2,99956,54882	43,45118
970	2,98677,17343	44,74956	1000	3,00000,00000	43,40775
971	2,98721,92299	44,70350	1001	3,00043,40775	43,36440
972	2,98766,62649	44,65754	1002	3,00086,77215	43,32115
973	2,98811,28403	44,61166	1003	3,00130,09330	43,27798
974	2,98855,89569	44,56588	1004	3,00173,37128	43,23490
975	2,98900,46157	44,52020	1005	3,00216,60618	43,19189
976	2,98944,98177	44,47460	1006	3,00259,79807	43,14899
977	2,98989,45637	44,42911	1007	3,00302,94706	43,10615
978	2,99033,88548	44,38370	1008	3,00346,05321	43,06341
979	2,99078,26918	44,33839	1009	3,00389,11662	43,02076
980	2,99122,60757	44,29317	1010	3,00432,13738	42,97818
981	2,99166,90074	44,24804	1011	3,00475,11556	42,93569
982	2,99211,14878	44,20300	1012	3,00518,05125	42,89329
983	2,99255,35178	44,15806	1013	3,00560,94454	42,85096
984	2,99299,50984	44,11321	1014	3,00603,79550	42,80872
985	2,99343,62305	44,06844	1015	3,00646,60422	42,76657
986	2,99387,69149	44,02378	1016	3,00689,37079	42,72450
987	2,99431,71527	43,97919	1017	3,00732,09529	42,68251
988	2,99475,69446	43,93470	1018	3,00774,77780	42,64060
989	2,99519,62916	43,89030	1019	3,00817,41840	42,59878
990	2,99563,51946	43,84599	1020	3,00860,01718	42,55703

N.	Logarithmi	Differ.
1021	3,00902,57421	42,51537
1022	3,00945,08958	42,47379
1023	3,00987,56337	42,43229
1024	3,01029,99566	42,39088
1025	3,01072,38654	42,34954
1026	3,01114,73608	42,30828
1027	3,01157,04436	42,26711
1028	3,01199,31147	42,22601
1029	3,01241,53748	42,18499
1030	3,01283,72247	42,14406
1031	3,01325,86653	42,10320
1032	3,01367,96973	42,06242
1033	3,01410,03215	42,02173
1034	3,01452,05388	41,98110
1035	3,01494,03498	41,94056
1036	3,01535,97554	41,90010
1037	3,01577,87564	41,85971
1038	3,01619,73535	41,81941
1039	3,01661,55476	41,77917
1040	3,01703,33393	41,73902
1041	3,01745,07295	41,69895
1042	3,01786,77190	41,65894
1043	3,01828,43084	41,61903
1044	3,01870,04987	41,57917
1045	3,01911,62904	41,53941
1046	3,01953,16845	41,49972
1047	3,01994,66817	41,46009
1048	3,02036,12826	41,42056
1049	3,02077,54882	41,38109
1050	3,02118,92991	41,34169

N.	Logarithmi	Differ.
1051	3,02160,27160	41,30238
1052	3,02201,57398	41,26314
1053	3,02242,83712	41,22397
1054	3,02284,06109	41,18487
1055	3,02325,24596	41,14586
1056	3,02366,39182	41,10691
1057	3,02407,49873	41,06804
1058	3,02448,56677	41,02924
1059	3,02489,59601	40,99052
1060	3,02530,58653	40,95186
1061	3,02571,53839	40,91328
1062	3,02612,45167	40,87478
1063	3,02653,32645	40,83635
1064	3,02694,16280	40,79798
1065	3,02734,96078	40,75969
1066	3,02775,72047	40,72147
1067	3,02816,44194	40,68333
1068	3,02857,12527	40,64525
1069	3,02897,77052	40,60725
1070	3,02938,37777	40,56931
1071	3,02978,94708	40,53146
1072	3,03019,47854	40,49366
1073	3,03059,97220	40,45594
1074	3,03100,42814	40,41829
1075	3,03140,84643	40,38070
1076	3,03181,22713	40,34320
1077	3,03221,57033	40,30576
1078	3,03261,87609	40,26838
1079	3,03302,14447	40,23108
1080	3,03342,37555	40,19385

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
1081	3,03382,56940	40,15668	1111	3,04571,40589	39,07283
1082	3,03422,72608	40,11958	1112	3,04610,47872	39,03771
1083	3,03462,84566	40,08256	1113	3,04649,51643	39,00265
1084	3,03502,92822	40,04560	1114	3,04688,51908	38,96766
1085	3,03542,97382	40,00871	1115	3,04727,48674	38,93272
1086	3,03582,98253	39,97188	1116	3,04766,41946	38,89785
1087	3,03622,95441	39,93513	1117	3,04805,31731	38,86305
1088	3,03662,88954	39,89844	1118	3,04844,18036	38,82829
1089	3,03702,78798	39,86181	1119	3,04883,00865	38,79362
1090	3,03742,64979	39,82527	1120	3,04921,80227	38,75899
1091	3,03782,47506	39,78878	1121	3,04960,56127	38,72443
1092	3,03822,26384	39,75235	1122	3,04999,28569	38,68994
1093	3,03862,01619	39,71601	1123	3,05037,97563	38,65549
1094	3,03901,73220	39,67972	1124	3,05076,63112	38,62112
1095	3,03941,41192	39,64349	1125	3,05115,25224	38,58681
1096	3,03981,05541	39,60735	1126	3,05153,83905	38,55255
1097	3,04020,66276	39,57125	1127	3,05192,39160	38,51836
1098	3,04060,23401	39,53523	1128	3,05230,90996	38,48423
1099	3,04099,76924	39,49928	1129	3,05269,39419	38,45016
1100	3,04139,26852	39,46338	1130	3,05307,84435	38,41614
1101	3,04178,73190	39,42755	1131	3,05346,26049	38,38220
1102	3,04218,15945	39,39179	1132	3,05384,64269	38,34830
1103	3,04257,55124	39,35610	1133	3,05422,99099	38,31447
1104	3,04296,90734	39,32046	1134	3,05461,30546	38,28069
1105	3,04336,22780	39,28490	1135	3,05499,58615	38,24699
1106	3,04375,51270	39,24939	1136	3,05537,83314	38,21333
1107	3,04414,76209	39,21395	1137	3,05576,04647	38,17974
1108	3,04453,97604	39,17857	1138	3,05614,22621	38,14620
1109	3,04493,15461	39,14327	1139	3,05652,37241	38,11272
1110	3,04532,29788	39,10801	1140	3,05690,48513	38,07931

N.	Logarithmi	Differ.
1141	3,05728,56444	38,04595
1142	3,05766,61039	38,01265
1143	3,05804,62304	37,97941
1144	3,05842,60245	37,94622
1145	3,05880,54867	37,91309
1146	3,05918,46176	37,88003
1147	3,05956,34179	37,84702
1148	3,05994,18881	37,81406
1149	3,06032,00287	37,78117
1150	3,06069,78404	37,74832
1151	3,06107,53236	37,71555
1152	3,06145,24791	37,68282
1153	3,06182,93073	37,65015
1154	3,06220,58088	37,61754
1155	3,06258,19842	37,58499
1156	3,06295,78341	37,55249
1157	3,06333,33590	37,52004
1158	3,06370,85594	37,48766
1159	3,06408,34360	37,45532
1160	3,06445,79892	37,42305
1161	3,06483,22197	37,39084
1162	3,06520,61281	37,35866
1163	3,06557,97147	37,32656
1164	3,06595,29803	37,29451
1165	3,06632,59254	37,26250
1166	3,06669,85504	37,23056
1167	3,06707,08560	37,19868
1168	3,06744,28428	37,16684
1169	3,06781,45112	37,13505
1170	3,06818,58617	37,10334

N.	Logarithmi	Differ.
1171	3,06855,68951	37,07166
1172	3,06892,76117	37,04004
1173	3,06929,80121	37,00848
1174	3,06966,80969	36,97697
1175	3,07003,78666	36,94551
1176	3,07040,73217	36,91411
1177	3,07077,64628	36,88277
1178	3,07114,52905	36,85146
1179	3,07151,38051	36,82022
1180	3,07188,20073	36,78903
1181	3,07224,98976	36,75789
1182	3,07261,74765	36,72681
1183	3,07298,47446	36,69578
1184	3,07335,17024	36,66479
1185	3,07371,83503	36,63387
1186	3,07408,46890	36,60300
1187	3,07445,07190	36,57216
1188	3,07481,64406	36,54140
1189	3,07518,18546	36,51068
1190	3,07554,69614	36,48001
1191	3,07591,17615	36,44939
1192	3,07627,62554	36,41883
1193	3,07664,04437	36,38831
1194	3,07700,43268	36,35785
1195	3,07736,79053	36,32744
1196	3,07773,11797	36,29707
1197	3,07809,41504	36,26677
1198	3,07845,68181	36,23650
1199	3,07881,91831	36,20629
1200	3,07918,12460	36,17614

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
1201	3,07954,30074	36,14603	1231	3,09025,80529	35,26549
1202	3,07990,44677	36,11596	1232	3,09061,07078	35,23688
1203	3,08026,56273	36,08596	1233	3,09096,30766	35,20831
1204	3,08062,64869	36,05600	1234	3,09131,51597	35,17979
1205	3,08098,70469	36,02609	1235	3,09166,69576	35,15132
1206	3,08134,73078	35,99623	1236	3,09201,84708	35,12288
1207	3,08170,72701	35,96642	1237	3,09236,96996	35,09451
1208	3,08206,69343	35,93666	1238	3,09272,06447	35,05617
1209	3,08242,63009	35,90694	1239	3,09307,12064	35,04788
1210	3,08278,53703	35,87728	1240	3,09342,16852	35,00963
1211	3,08314,41431	35,84767	1241	3,09377,17815	34,98143
1212	3,08350,26198	35,81811	1242	3,09412,15958	34,95328
1213	3,08386,08009	35,78858	1243	3,09447,11286	34,92518
1214	3,08421,86867	35,75912	1244	3,09482,03804	34,89710
1215	3,08457,62779	35,72970	1245	3,09516,93514	34,86909
1216	3,08493,35749	35,70033	1246	3,09551,80423	34,84112
1217	3,08529,05782	35,67101	1247	3,09586,64535	34,81318
1218	3,08564,72883	35,64173	1248	3,09621,45853	34,78531
1219	3,08600,37056	35,61251	1249	3,09656,24384	34,75746
1220	3,08635,98307	35,58332	1250	3,09691,00130	34,72967
1221	3,08671,56639	35,55420	1251	3,09725,73097	34,70192
1222	3,08707,12059	35,52511	1252	3,09760,43289	34,67421
1223	3,08742,64570	35,49608	1253	3,09795,10710	34,64655
1224	3,08778,14178	35,46709	1254	3,09829,75365	34,61893
1225	3,08813,60887	35,43815	1255	3,09864,37258	34,59136
1226	3,08849,04702	35,40925	1256	3,09898,96394	34,56383
1227	3,08884,45627	35,38041	1257	3,09933,52777	34,53634
1228	3,08919,83668	35,35161	1258	3,09968,06411	34,50890
1229	3,08955,18829	35,32285	1259	3,10002,57301	34,48150
1230	3,08990,51114	35,29415	1260	3,10037,05451	34,45415

N.	Logarithmi	Differ.
1261	3,10071,50866	34,42683
1262	3,10105,93549	34,39957
1263	3,10140,33506	34,37233
1264	3,10174,70739	34,34516
1265	3,10209,05255	34,31802
1266	3,10243,37057	34,29092
1267	3,10277,66149	34,26386
1268	3,10311,92535	34,23686
1269	3,10346,16221	34,20989
1270	3,10380,37210	34,18296
1271	3,10414,55506	34,15607
1272	3,10448,71113	34,12924
1273	3,10482,84037	34,10243
1274	3,10516,94280	34,07568
1275	3,10551,01848	34,04896
1276	3,10585,06744	34,02229
1277	3,10619,08973	33,99565
1278	3,10653,08538	33,96907
1279	3,10687,05445	33,94251
1280	3,10720,99696	33,91601
1281	3,10754,91297	33,88955
1282	3,10788,80252	33,86312
1283	3,10822,66564	33,83673
1284	3,10856,50237	33,81040
1285	3,10890,31277	33,78409
1286	3,10924,09686	33,75783
1287	3,10957,85469	33,73161
1288	3,10991,58630	33,70544
1289	3,11025,29174	33,67929
1290	3,11058,97103	33,65320

N.	Logarithmi	Differ.
1291	3,11092,62423	33,62714
1292	3,11126,25137	33,60112
1293	3,11159,85249	33,57514
1294	3,11193,42763	33,54921
1295	3,11226,97684	33,52331
1296	3,11260,50015	33,49746
1297	3,11293,99761	33,47164
1298	3,11327,46025	33,44586
1299	3,11360,91511	33,42012
1300	3,11394,33523	33,39443
1301	3,11427,72966	33,36876
1302	3,11461,09842	33,34315
1303	3,11494,44157	33,31757
1304	3,11527,75914	33,29203
1305	3,11561,05117	33,26652
1306	3,11594,31769	33,24107
1307	3,11627,55876	33,21564
1308	3,11660,77440	33,19026
1309	3,11693,96466	33,16491
1310	3,11727,12957	33,13960
1311	3,11760,26917	33,11433
1312	3,11793,38350	33,08911
1313	3,11826,47261	33,06391
1314	3,11859,53652	33,03876
1315	3,11892,57528	33,01365
1316	3,11925,58893	32,98857
1317	3,11958,57750	32,96353
1318	3,11991,54103	32,93852
1319	3,12024,47955	32,91357
1320	3,12057,39312	32,88864

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
1321	3,12090,28176	32,86375	1351	3,13065,53490	32,13426
1322	3,12123,14551	32,83891	1352	3,13097,66916	32,11050
1323	3,12155,98442	32,81409	1353	3,13129,77966	32,08677
1324	3,12188,79851	32,78932	1354	3,13161,86643	32,06309
1325	3,12221,58783	32,76458	1355	3,13193,92952	32,03943
1326	3,12254,35241	32,73988	1356	3,13225,96895	32,01582
1327	3,12287,09229	32,71521	1357	3,13257,98477	31,99222
1328	3,12319,80750	32,69059	1358	3,13289,97699	31,96868
1329	3,12352,49809	32,66601	1359	3,13321,94567	31,94517
1330	3,12385,16410	32,64145	1360	3,13353,89084	31,92168
1331	3,12417,80555	32,61693	1361	3,13385,81252	31,89824
1332	3,12450,42248	32,59246	1362	3,13417,71076	31,87482
1333	3,12483,01494	32,56802	1363	3,13449,58558	31,85145
1334	3,12515,58296	32,54361	1364	3,13481,43703	31,82811
1335	3,12548,12657	32,51924	1365	3,13513,26514	31,80479
1336	3,12580,64581	32,49492	1366	3,13545,06993	31,78153
1337	3,12613,14073	32,47061	1367	3,13576,85146	31,75828
1338	3,12645,61134	32,44636	1368	3,13608,60974	31,73507
1339	3,12678,05770	32,42214	1369	3,13640,34481	31,71191
1340	3,12710,47984	32,39795	1370	3,13672,05672	31,68876
1341	3,12742,87779	32,37379	1371	3,13703,74548	31,66566
1342	3,12775,25158	32,34969	1372	3,13735,41114	31,64258
1343	3,12807,60127	32,32560	1373	3,13767,05372	31,61955
1344	3,12839,92687	32,30156	1374	3,13798,67327	31,59655
1345	3,12872,22843	32,27756	1375	3,13830,26982	31,57357
1346	3,12904,50599	32,25358	1376	3,13861,84339	31,55064
1347	3,12936,75957	32,22965	1377	3,13893,39403	31,52773
1348	3,12968,98922	32,20575	1378	3,13924,92176	31,50486
1349	3,13001,19497	32,18188	1379	3,13956,42662	31,48202
1350	3,13033,37685	32,15805	1380	3,13987,90864	31,45922

N.	Logarithmi	Differ.
1381	3,14019,36786	31,43644
1382	3,14050,80430	31,41371
1383	3,14082,21801	31,39100
1384	3,14113,60901	31,36833
1385	3,14144,97734	31,34569
1386	3,14176,32303	31,32308
1387	3,14207,64611	31,30050
1388	3,14238,94661	31,27796
1389	3,14270,22457	31,25546
1390	3,14301,48003	31,23297
1391	3,14332,71300	31,21053
1392	3,14363,92353	31,18811
1393	3,14395,11164	31,16574
1394	3,14426,27738	31,14338
1395	3,14457,42076	31,12107
1396	3,14488,54183	31,09878
1397	3,14519,64061	31,07653
1398	3,14550,71714	31,05431
1399	3,14581,77145	31,03212
1400	3,14612,80357	31,00996
1401	3,14643,81353	30,98783
1402	3,14674,80136	30,96574
1403	3,14705,76710	30,94368
1404	3,14736,71078	30,92164
1405	3,14767,63242	30,89965
1406	3,14798,53207	30,87767
1407	3,14829,40974	30,85574
1408	3,14860,26548	30,83383
1409	3,14891,09931	30,81196
1410	3,14921,91127	30,79011

N.	Logarithmi	Differ.
1411	3,14952,70138	30,76829
1412	3,14983,46967	30,74651
1413	3,15014,21618	30,72477
1414	3,15044,94095	30,70304
1415	3.15075,64399	30,68135
1416	3,15106,32534	30,65968
1417	3,15136,98502	30,63806
1418	3,15167,62308	30,61647
1419	3,15198,23955	30,59489
1420	3,15228,83444	30,57335
1421	3,15259,40779	30,55185
1422	3,15289,95964	30,53037
1423	3,15320,49001	30,50892
1424	3,15350,99893	30,4875[illegible]
1425	3,15381,48643	30,4661[illegible]
1426	3,15411,95255	30,4447[illegible]
1427	3,15442,39731	30,4234[illegible]
1428	3,15472,82074	30,4021[illegible]
1429	3,15503,22288	30,3808[illegible]
1430	3,15533,60375	30,3596[illegible]
1431	3,15563,96338	30,3384[illegible]
1432	3,15594,30180	30,317[illegible]
1433	3,15624,61904	30,296[illegible]
1434	3,15654,91513	30,274[illegible]
1435	3,15685,19011	30,253[illegible]
1436	3,15715,44399	30,232[illegible]
1437	3,15745,67681	30,211[illegible]
1438	3,15775,88860	30,190[illegible]
1439	3,15806,07939	30,169[illegible]
1440	3,15836,24921	30,148[illegible]

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
1441	3,15866,39808	30,12796	1471	3,16761,26727	29,51373
1442	3,15896,52604	30,10707	1472	3,16790,78100	29,49368
1443	3,15926,63311	30,08621	1473	3,16820,27468	29,47367
1444	3,15956,71932	30,06539	1474	3,16849,74835	29.45368
1445	3,15986,78471	30,04459	1475	3,16879,20203	29,43372
1446	3,16016,82930	30,02381	1476	3,16908,63575	29,41378
1447	3,16046,85311	30,00308	1477	3,16938,04953	29,39388
1448	3,16076,85619	29,98236	1478	3,16967,44341	29,37399
1449	3,16106,83855	29,96167	1479	3,16996,81740	29,35414
1450	3,16136,80022	29,94102	1480	3,17026,17154	29,33431
1451	3,16166,74124	29,92040	1481	3,17055,50585	29,31451
1452	3,16196,66164	29,89979	1482	3,17084,82036	29,29474
1453	3,16226,56143	29,87922	1483	3,17114,11510	29,27499
1454	3,16256,44065	29,85868	1484	3,17143,39009	29,25528
1455	3,16286,29933	29,83817	1485	3,17172,64537	29,23557
1456	3,16316,13750	29,81768	1486	3,17201,88094	29,21591
1457	3,16345,95518	29,79722	1487	3,17231,09685	29,19627
1458	3,16375,75240	29,77679	1488	3,17260,29312	29,17666
1459	3,16405,52919	29,75639	1489	3,17289,46978	29,15706
1460	3,16435,28558	29,73601	1490	3,17318,62684	29,13751
1461	3,16465,02159	29,71567	1491	3,17347,76435	29,11796
1462	3,16494,73726	29,69535	1492	3,17376,88[illegible]	29,09846
1463	3,16524,43261	29,67506	1493	3,17405,98077	29,07898
1464	3,16554,10767	29,65480	1494	3,17435,05975	29,05952
1465	3,16583,76247	29,63456	1495	3,17464,11927	29,04008
1466	3,16613,39703	29,61435	1496	3,17493,15935	29,02068
1467	3,16643,01138	29,59418	1497	3,17522,18003	29,00131
1468	3,16672,60556	29,57402	1498	3,17551,18134	28,98194
1469	3,16702,17958	29,55389	1499	3,17580,16328	28,96263
1470	3,16731,73347	29,53380	1500	3,17509,12591	28,94331

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
1501	3,17638,06922	28,92405	1531	3,18497,51907	[illegible]
1502	3,17666,99327	28,90479	1532	3,18525,87653	[illegible]
1503	3,17695,89806	28,88557	1533	3,18554,21549	[illegible]
1504	3,17724,78363	28,86636	1534	3,18582,53596	[illegible]
1505	3,17753,64999	28,84720	1535	3,18610,83798	[illegible]
1506	3,17782,49719	28,82804	1536	3,18639,12157	[illegible]
1507	3,17811,32523	28,80892	1537	3,18667,38675	[illegible]
1508	3,17840,13415	28,78983	1538	3,18695,63355	[illegible]
1509	3,17868,92398	28,77075	1539	3,18723,86198	[illegible]
1510	3,17897,69473	28,75170	1540	3,18752,07208	[illegible]
1511	3,17926,44643	28,73269	1541	3,18780,26387	[illegible]
1512	3,17955,17912	28,71368	1542	3,18808,43737	[illegible]
1513	3,17983,89280	28,69472	1543	3,18836,59261	[illegible]
1514	3,18012,58752	28,67576	1544	3,18864,72960	[illegible]
1515	3,18041,26328	28,65685	1545	3,18892,84838	[illegible]
1516	3,18069,92013	28,63795	1546	3,18920,94896	[illegible]
1517	3,18098,55808	28,61908	1547	3,18949,03137	[illegible]
1518	3,18127,17716	28,60023	1548	3,18977,09563	[illegible]
1519	3,18155,77739	28,58140	1549	3,19005,14178	[illegible]
1520	3,18184,35879	28,56262	1550	3,19033,16982	[illegible]
1521	3,18212,92141	28,54383	1551	3,19061,17978	[illegible]
1522	3,18[illegible]1,45524	28,52509	1552	3,19089,17169	[illegible]
1523	3,18269,99033	28,50637	1553	3,19117,14557	[illegible]
1524	3,18298,49670	28,48767	1554	3,19145,10145	[illegible]
1525	3,18326,98437	28,46899	1555	3,19173,03934	[illegible]
1526	3,18355,45336	28,45035	1556	3,19200,95927	[illegible]
1527	3,18383,90371	28,43171	1557	3,19228,86126	[illegible]
1528	3,18412,33542	28,41312	1558	3,19256,74533	[illegible]
1529	3,18440,74854	28,39454	1559	3,19284,61152	[illegible]
1530	3,18469,14308	28,37599	1560	3,19312,45984	[illegible]

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
1561	3,19340,29031	27,81264	1591	3,20167,01796	27,28838
1562	3,19368,10295	27,79485	1592	3,20194,30634	27,27124
1563	3,19395,89780	27,77707	1593	3,20221,57758	27,25413
1564	3,19423,67487	27,75932	1594	3,20248,83171	27,23703
1565	3,19451,43419	27,74158	1595	3,20276,06874	27,21996
1566	3,19479,17577	27,72388	1596	3,20303,28870	27,20291
1567	3,19506,89965	27,70618	1597	3,20330,49161	27,18589
1568	3,19534,60583	27,68853	1598	3,20357,67750	27,16887
1569	3,19562,29436	27,67088	1599	3,20384,84637	27,15190
1570	3,19589,96524	27,65326	1600	3,20411,99827	27,13492
1571	3,19617,61850	27,63567	1601	3,20439,13319	27,11798
1572	3,19645,25417	27,61809	1602	3,20466,25117	27,10107
1573	3,19672,87226	27,60054	1603	3,20493,35224	27,08415
1574	3,19700,47280	27,58301	1604	3,20520,43639	27,06728
1575	3,19728,05581	27,56551	1605	3,20547,50367	27,05042
1576	3,19755,62132	27,54801	1606	3,20574,55409	27,03359
1577	3,19783,16933	27,53056	1607	3,20601,58768	27,01676
1578	3,19810,69989	27,51311	1608	3,20628,60444	26,99997
1579	3,19838,21300	27,49570	1609	3,20655,60441	26,98319
1580	3,19865,70870	27,47829	1610	3,20682,58760	26,96644
1581	3,19893,18699	27,46093	1611	3,20709,55404	26,94971
1582	3,19920,64792	27,44357	1612	3,20736,50375	26,93299
1583	3,19948,09149	27,42624	1613	3,20763,43674	26,91630
1584	3,19975,51773	27,40893	1614	3,20790,35304	26,89963
1585	3,20002,92666	27,39164	1615	3,20817,25267	26,88297
1586	3,20030,31830	27,37438	1616	3,20844,13564	26,86635
1587	3,20057,69268	27,35713	1617	3,20871,00199	26,84974
1588	3,20085,04981	27,33991	1618	3,20897,85173	26,83315
1589	3,20112,38972	27,32271	1619	3,20924,68488	26,81657
1590	3,20139,71243	27,20553	1620	3,20951,50145	26,80003

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
1621	3,20978,30148	26,78351	1651	3,21774,70733	26,29697
1622	3,21005,08499	26,76609	1652	3,21801,00430	26,28106
1623	3,21031,85198	26,75051	1653	3,21827,28536	26,26516
1624	3,21058,60249	26,73404	1654	3,21853,55052	26,24929
1625	3,21085,33653	26,71760	1655	3,21879,79981	26,23343
1626	3,21112,05413	26,70116	1656	3,21906,03324	26,26760
1627	3,21138,75529	26,68477	1657	3,21932,25084	26,20178
1628	3,21165,44006	26,66837	1658	3,21958,45262	26,18598
1629	3,21192,10843	26,65201	1659	3,21984,63860	26,17020
1630	3,21218,76044	26,63566	1660	3,22010,80880	26,15445
1631	3,21245,39610	26,61934	1661	3,22036,96325	26,13869
1632	3,21272,01544	26,60303	1662	3,22063,10194	26,12298
1633	3,21298,61847	26,58675	1663	3,22089,22492	26,10728
1634	3,21325,20522	26,57048	1664	3,22115,33220	26,09158
1635	3,21351,77570	26,55423	1665	3,22141,42378	26,07593
1636	3,21378,32993	26,53801	1666	3,22167,49971	26,06027
1637	3,21404,86794	26,52180	1667	3,22193,55998	26,04465
1638	3,21431,38974	26,50562	1668	3,22219,60463	26,02904
1639	3,21457,89536	26,48944	1669	3,22245,63367	26,01344
1640	3,21484,38480	26,47331	1670	3,22271,64711	25,99788
1641	3,21510,85811	26,45717	1671	3,22297,64499	25,98232
1642	3,21537,31528	26,44106	1672	3,22323,62731	25,96679
1643	3,21563,75634	26,42498	1673	3,22349,59410	25,95127
1644	3,21590,18132	26,40891	1674	3,22375,54537	25,93577
1645	3,21616,59023	26,39286	1675	3,22401,48114	25,9202[illegible]
1646	3,21642,98309	26,37683	1676	3,22427,40143	25,9048[illegible]
1647	3,21669,35992	26,36082	1677	3,22453,30626	25,8893[illegible]
1648	3,21695,72074	26,34482	1678	3,22479,19565	25,8739[illegible]
1649	3,21722,06556	26,32886	1679	3,22505,06961	25,8585[illegible]
1650	3,21748,39442	26,31291	1680	3,22530,92817	25,8431[illegible]

N.	Logarithmi	Differ
1681	3,22556,77134	25,82781
1682	3,22582,59915	25,81245
1683	3,22608,41160	25,79712
1684	3,22634,20872	25,78180
1685	3,22659,99052	25,76651
1686	3,22685,75703	25,75123
1687	3,22711,50826	25,73597
1688	3,22737,24423	25,72073
1689	3,22762,96496	25,70550
1690	3,22788,67046	25,69030
1691	3,22814,36076	25,67511
1692	3,22840,03587	25,65994
1693	3,22865,69581	25,64479
1694	3,22891,34060	25,62965
1695	3,22916,97025	25,61454
1696	3,22942,58479	25,59944
1697	3,22968,18423	25,58436
1698	3,22993,76859	25,56930
1699	3,23019,33789	25,55425
1700	3,23044,89214	25,53922
1701	3,23070,43136	25,52421
1702	3,23095,95557	25,50923
1703	3,23121,46480	25,49424
1704	3,23146,95904	25,47929
1705	3,23172,43833	25,46435
1706	3,23197,90268	25,44943
1707	3,23223,35211	25,43453
1708	3,23248,78664	25,41963
1709	3,23274,20627	25,40477
1710	3,23299,61104	25,38991

N.	Logarithmi	Diffet.
1711	3,23325,00095	25,37508
1712	3,23350,37603	25,36027
1713	3,23375,73630	25,34546
1714	3,23401,08176	25,33068
1715	3,23426,41244	25,31591
1716	3,23451,72835	25,30117
1717	3,23477,02952	25,28643
1718	3,23502,31595	25,27172
1719	3,23527,58767	25,25702
1720	3,23552,84469	25,24234
1721	3,23578,08703	25,22768
1722	3,23603,31471	25,21303
1723	3,23628,52774	25,19841
1724	3,23653,72615	25,18379
1725	3,23678,90994	25,16920
1726	3,23704,07914	25,15462
1727	3,23729,23376	25,14005
1728	3,23754,37381	25,12552
1729	3,23779,49933	25,11098
1730	3,23804,61031	25,09648
1731	3,23829,70679	25,08198
1732	3,23854,78877	25,06750
1733	3,23879,85627	25,05304
1734	3,23904,90931	25,03860
1735	3,23929,94791	25,02417
1736	3,23954,97208	25,00976
1737	3,23979,98184	24,99537
1738	3,24004,97721	24,98099
1739	3,24029,95820	24,96663
1740	3,24054,92483	24,95228

N.	Logarithmi	Differ.
1741	3,24079,87711	24,93796
1742	3,24104,81507	24,92364
1743	3,24129,73871	24,90935
1744	3,24154,64806	24,89507
1745	3,24179,54313	24,88081
1746	3,24204,42394	24,86656
1747	3,24229,29050	24,85233
1748	3,24254,14283	24,83812
1749	3,24278,98095	24,82392
1750	3,24303,80487	24,80974
1751	3,24328,61461	24,79557
1752	3,24353,41018	24,78143
1753	3,24378,19161	24,76729
1754	3,24402,95890	24,75318
1755	3,24427,71208	24,73908
1756	3,24452,45116	24,72499
1757	3,24477,17615	24,71092
1758	3,24501,88707	24,69688
1759	3,24526,58395	24,68283
1760	3,24551,26678	24,66882
1761	3,24575,93560	24,65481
1762	3,24600,59041	24,64082
1763	3,24625,23123	24,62685
1764	3,24649,85808	24,61289
1765	3,24674,47097	24,59895
1766	3,24699,06992	24,58503
1767	3,24723,65495	24,57112
1768	3,24748,22607	24,55722
1769	3,24772,78329	24,54335
1770	3,24797,32664	24,52948

N.	Logarithmi	Differ.
1771	3,24821,85612	24,5156[illegible]
1772	3,24846,37176	24,501[illegible]
1773	3,24870,87356	24,4879[illegible]
1774	3,24895,36155	24,474[illegible]
1775	3,24919,83574	24,460[illegible]
1776	3,24944,29614	24,446[illegible]
1777	3,24968,74278	24,432[illegible]
1778	3,24993,17566	24,419[illegible]
1779	3,25017,59481	24,405[illegible]
1780	3,25042,00023	24,39[illegible]
1781	3,25066,39195	24,37[illegible]
1782	3,25090,76997	24,36[illegible]
1783	3,25115,13432	24,35[illegible]
1784	3,25139,48500	24,33[illegible]
1785	3,25163,82204	24,32[illegible]
1786	3,25188,14546	24,30[illegible]
1787	3,25212,45525	24,[illegible]
1788	3,25236,75145	24,[illegible]
1789	3,25261,03406	24,[illegible]
1790	3,25285,30310	24,[illegible]
1791	3,25309,55858	24,[illegible]
1792	3,25333,80053	24,[illegible]
1793	3,25358,02896	24,[illegible]
1794	3,25382,24387	24,[illegible]
1795	3,25406,44529	24,[illegible]
1796	3,25430,63323	24,[illegible]
1797	3,25454,80771	24,[illegible]
1798	3,25478,96874	24,[illegible]
1799	3,25503,11633	24,[illegible]
1800	3,25527,25051	24,[illegible]

N.	Logarithmi	Differ.
1801	3,25551,37128	24,10738
1802	3,25575,47866	24,09401
1803	3,25599,57267	24,08065
1804	3,25623,65332	24,06730
1805	3,25647,72062	24,05396
1806	3,25671,77460	24,04066
1807	3,25695,81526	24,02735
1808	3,25719,84261	24,01408
1809	3,25743,85669	24,00080
1810	3,25767,85749	23,98754
1811	3,25791,84503	23,97430
1812	3,25815,81933	23,96108
1813	3,25839,78041	23,94786
1814	3,25863,72827	23,93467
1815	3,25887,66294	23,92148
1816	3,25911,58442	23,90831
1817	3,25935,49273	23,89516
1818	3,25959,38789	23,88202
1819	3,25983,26991	23,86889
1820	3,26007,13880	23,85578
1821	3,26030,99458	23,84268
1822	3,26054,83726	23,82961
1823	3,26078,66687	23,81653
1824	3,26102,48340	23,80348
1825	3,26126,28688	23,79044
1826	3,26150,07732	23,77742
1827	3,26173,85474	23,76440
1828	3,26197,61914	23,75141
1829	3,26221,37055	23,73842
1830	3,26245,10897	23,72546

N.	Logarithmi	Differ.
1831	3,26268,83443	23,71250
1832	3,26292,54693	23,69957
1833	3,26316,24650	23,68663
1834	3,26339,93313	23,67373
1835	3,26363,60686	23,66083
1836	3,26387,26769	23,64794
1837	3,26410,91563	23,63508
1838	3,26434,55071	23,62221
1839	3,26458,17292	23,60938
1840	3,26481,78230	23,59655
1841	3,26505,37885	23,58374
1842	3,26528,96259	23,57093
1843	3,26552,53352	23,55815
1844	3,26576,09167	23,54538
1845	3,26599,63705	23,53262
1846	3,26623,16967	23,51987
1847	3,26646,98954	23,50715
1848	3,26670,19669	23,49443
1849	3,26693,69112	23,48172
1850	3,26717,17284	23,46904
1851	3,26740,64188	23,45635
1852	3,26764,09823	23,44370
1853	3,26787,54193	23,43105
1854	3,26810,97298	23,41842
1855	3,26834,39140	23,40579
1856	3,26857,79719	23,39318
1857	3,26881,19037	23,38060
1858	3,26904,57097	23,36801
1859	3,26927,93898	23,35544
1860	3,26951,29442	23,34289

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
1861	3,26974,63731	23,33035	1891	3,27669,15288	22,96033
1862	3,26997,96766	23,31783	1892	3,27692,11321	22,94819
1863	3,27021,28549	23,30531	1893	3,27715,06140	22,93607
1864	3,27044,59080	23,29281	1894	3,27737,99747	22,92396
1865	3,27067,88361	23,28033	1895	3,27760,92143	22,91187
1866	3,27091,16394	23,26785	1896	3,27783,83330	22,89979
1867	3,27114,43179	23,25540	1897	3,27806,73309	22,88772
1868	3,27137,68719	23,24295	1898	3,27829,62081	22,87566
1869	3,27160,93014	23,23051	1899	3,27852,49647	22,86363
1870	3,27184,16065	23,21810	1900	3,27875,36010	22,85159
1871	3,27207,37875	23,20569	1901	3,27898,21169	22,83957
1872	3,27230,58444	23,19330	1902	3,27921,05126	22,82757
1873	3,27253,77774	23,18092	1903	3,27943,87883	22,81557
1874	3,27276,95866	23,16855	1904	3,27966,69440	22,80360
1875	3,27300,12721	23,15619	1905	3,27989,49800	22,79163
1876	3,27323,28340	23,14386	1906	3,28012,28963	22,77967
1877	3,27346,42726	23,13154	1907	3,28035,06930	22,76774
1878	3,27369,55880	23,11921	1908	3,28057,83704	22,75580
1879	3,27392,67801	23,10692	1909	3,28080,59284	22,74388
1880	3,27415,78493	23,09463	1910	3,28103,33672	22,73199
1881	3,27438,87956	23,08235	1911	3,28126,06871	22,72008
1882	3,27461,96191	23,07009	1912	3,28148,78879	22,70821
1883	3,27485,03200	23,05785	1913	3,28171,49700	22,69634
1884	3,27508,08985	23,04560	1914	3,28194,19334	22,68449
1885	3,27531,13545	23,03339	1915	3,28216,87783	22,67264
1886	3,27554,16884	23,02118	1916	3,28239,55047	22,66082
1887	3,27577,19002	23,00898	1917	3,28262,21129	22,64899
1888	3,27600,19900	22,99679	1918	3,28284,86028	22,63719
1889	3,27623,19579	22,98463	1919	3,28307,49747	22,62540
1890	3,27646,18042	22,97246	1920	3,28330,12287	22,613[illegible]

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
1921	3,28352,73649	22,60184	1951	3,29025,72694	22,25439
1922	3,28375,33833	22,59009	1952	3,29047,98133	22,24300
1923	3,28397,92842	22,57835	1953	3,29070,22433	22,23161
1924	3,28420,50677	22,56661	1954	3,29092,45594	22,22023
1925	3,28443,07338	22,55490	1955	3,29114,67617	22,20888
1926	3,28465,62828	22,54319	1956	3,29136,88505	22,19752
1927	3,28488,17147	22,53149	1957	3,29159,08257	22,18618
1928	3,28510,70296	22,51980	1958	3,29181,26875	22,17485
1929	3,28533,22276	22,50814	1959	3,29203,44360	22,16354
1930	3,28555,73090	22,49648	1960	3,29225,60714	22,15223
1931	3,28578,22738	22,48483	1961	3,29247,75937	22,14093
1932	3,28600,71221	22,47319	1962	3,29269,90030	22,12966
1933	3,28623,18540	22,46157	1963	3,29292,02996	22,11839
1934	3,28645,64697	22,44997	1964	3,29314,14835	22,10712
1935	3,28668,09694	22,43836	1965	3,29336,25547	22,09588
1936	3,28690,53530	22,42677	1966	3,29358,35135	22,08464
1937	3,28712,96207	22,41520	1967	3,29380,43599	22,07342
1938	3,28735,37727	22,40364	1968	3,29402,50941	22,06220
1939	3,28757,78091	22,39208	1969	3,29424,57161	22,05101
1940	3,28780,17299	22,38055	1970	3,29446,62262	22,03981
1941	3,28802,55354	22,36902	1971	3,29468,66243	22,02863
1942	3,28824,92256	22,35750	1972	3,29490,69106	22,01747
1943	3,28847,28006	22,34600	1973	3,29512,70853	22,00630
1944	3,28869,62606	22,33451	1974	3,29534,71483	21,99517
1945	3,28891,96057	22,32302	1975	3,29556,71000	21,98403
1946	3,28914,28359	22,31156	1976	3,29578,69403	21,97290
1947	3,28936,59515	22,30010	1977	3,29600,66693	21,96180
1948	3,28958,89525	22,28866	1978	3,29622,62873	21,95069
1949	3,28981,18391	22,27723	1979	3,29644,57942	21,93961
1950	3,29003,46114	22,26580	1980	3,29666,51903	21,92852

N.	Logarithmi	Differ.
1981	3,29688,44755	
1982	3,29710,36501	21,91746
1983	3,29732,27142	21,90641
1984	3,29754,16678	21,89536
1985	3,29776,05111	21,88433
1986	3,29797,92442	21,87331
1987	3,29819,78671	21,86229
1988	3,29841,63801	21,85130
1989	3,29863,47831	21,84030
1990	3,29885,30764	21,82933
1991	3,29907,12600	21,81836
1992	3,29928,93341	21,80741
1993	3,29950,72987	21,79646
1994	3,29972,51540	21,78553
1995	3,29994,29000	21,77460
1996	3,30016,05370	21,76370
1997	3,30037,80649	21,75279
1998	3,30059,54839	21,74190
1999	3,30081,27941	21,73102
2000	3,30102,99957	21,72016
2001	3,30124,70886	21,70929
2002	3,30146,40731	21,69845
2003	3,30168,09493	21,68762
2004	3,30189,77172	21,67679
2005	3,30211,43770	21,66598
2006	3,30233,09287	21,65517
2007	3,30254,73725	21,64438
2008	3,30276,37085	21,63360
2009	3,30297,99367	21,62282
2010	3,30319,60574	21,61207
		21,60132

N.	Logarithmi	Differ.
2011	3,30341,20706	
2012	3,30362,79764	21,59058
2013	3,30384,37749	21,57985
2014	3,30405,94662	21,56913
2015	3,30427,50505	21,55843
2016	3,30449,05278	21,54773
2017	3,30470,58982	21,53704
2018	3,30492,11619	21,52637
2019	3,30513,63189	21,51570
2020	3,30535,13694	21,50505
2021	3,30556,63135	21,49441
2022	3,30578,11513	21,48378
2023	3,30599,58828	21,47315
2024	3,30621,05082	21,46254
2025	3,30642,50276	21,45194
2026	3,30663,94410	21,44134
2027	3,30685,37487	21,43077
2028	3,30706,79507	21,42020
2029	3,30728,20470	21,40963
2030	3,30749,60379	21,39909
2031	3,30770,99234	21,38855
2032	3,30792,37036	21,37802
2033	3,30813,73786	21,36750
2034	3,30835,09486	21,35700
2035	3,30856,44136	21,34650
2036	3,30877,77737	21,33601
2037	3,30899,10290	21,32553
2038	3,30920,41797	21,31507
2039	3,30941,72258	21,304[illegible]
2040	3,30963,01674	21,29[illegible]
		21,283[illegible]

N.	Logarithmi	Differ.
2041	3,30984,30047	21,27331
2042	3,31005,57378	21,26288
2043	3,31026,83666	21,25249
2044	3,31048,08915	21,24208
2045	3,31069,33123	21,23171
2046	3,31090,56294	21,22133
2047	3,31111,78427	21,21096
2048	3,31132,99523	21,20061
2049	3,31154,19584	21,19027
2050	3,31175,38611	21,17993
2051	3,31196,56604	21,16960
2052	3,31217,73564	21,15930
2053	3,31238,89494	21,14899
2054	3,31260,04393	21,13869
2055	3,31281,18262	21,12841
2056	3,31302,31103	21,11814
2057	3,31323,42917	21,10787
2058	3,31344,53704	21,09762
2059	3,31365,63466	21,08738
2060	3,31386,72204	21,07714
2061	3,31407,79918	21,06691
2062	3,31428,86609	21,05671
2063	3,31449,92280	21,04650
2064	3,31470,96930	21,03630
2065	3,31492,00560	21,02612
2066	3,31513,03172	21,01594
2067	3,31534,04766	21,00578
2068	3,31555,05344	20,99563
2069	3,31576,04907	20,98548
2070	3,31597,03455	20,97534

N.	Logarithmi	Differ.
2071	3,31618,00989	20,96522
2072	3,31638,97511	20,95510
2073	3,31659,93021	20,94500
2074	3,31680,87521	20,93489
2075	3,31701,81010	20,92482
2076	3,31722,73492	20,91473
2077	3,31743,64965	20,90467
2078	3,31764,55432	20,89461
2079	3,31785,44893	20,88457
2080	3,31806,33350	20,87452
2081	3,31827,20802	20,86450
2082	3,31848,07252	20,85447
2083	3,31868,92699	20,84447
2084	3,31889,77146	20,83447
2085	3,31910,60593	20,82448
2086	3,31931,43041	20,81450
2087	3,31952,24491	20,80452
2088	3,31973,04943	20,79457
2089	3,31993,84400	20,78461
2090	3,32014,62861	20,77467
2091	3,32035,40328	20,76474
2092	3,32056,16802	20,75481
2093	3,32076,92283	20,74490
2094	3,32097,66773	20,73500
2095	3,32118,40273	20,72510
2096	3,32139,12783	20,71522
2097	3,32159,84305	20,70534
2098	3,32180,54839	20,69547
2099	3,32201,24386	20,68561
2100	3,32221,92947	20,67577

N.	Logarithmi	Differ.
2101	3,32242,60524	20,66593
2102	3,32263,27117	20,65610
2103	3,32283,92727	20,64628
2104	3,32304,57355	20,63647
2105	3,32325,21002	20,62666
2106	3,32345,83668	20,61688
2107	3,32366,45356	20,60709
2108	3,32387,06065	20,59732
2109	3,32407,65797	20,58756
2110	3,32428,24553	20,57780
2111	3,32448,82333	20,56806
2112	3,32469,39139	20,55832
2113	3,32489,94971	20,54859
2114	3,32510,49830	20,53887
2115	3,32531,03717	20,52917
2116	3,32551,56634	20,51946
2117	3,32572,08580	20,50978
2118	3,32592,59558	20,50009
2119	3,32613,09567	20,49042
2120	3,32633,58609	20,48076
2121	3,32654,06685	20,47111
2122	3,32674,53796	20,46146
2123	3,32694,99942	20,45182
2124	3,32715,45124	20,44220
2125	3,32735,89344	20,43258
2126	3,32756,32602	20,42297
2127	3,32776,74899	20,41337
2128	3,32797,16236	20,40378
2129	3,32817,56614	20,39420
2130	3,32837,96034	20,38463

N.	Logarithmi	Differ.
2131	3,32858,34497	20,37507
2132	3,32878,72004	20,36550
2133	3,32899,08554	20,35597
2134	3,32919,44151	20,34643
2135	3,32939,78794	20,33690
2136	3,32960,12484	20,32738
2137	3,32980,45222	20,31787
2138	3,33000,77009	20,30837
2139	3,33021,07846	20,29887
2140	3,33041,37733	20,28940
2141	3,33061,66673	20,27992
2142	3,33081,94665	20,27045
2143	3,33102,21710	20,26100
2144	3,33122,47810	20,25155
2145	3,33142,72965	20,24211
2146	3,33162,97176	20,23268
2147	3,33183,20444	20,22326
2148	3,33203,42770	20,21385
2149	3,33223,64155	20,20444
2150	3,33243,84599	20,19505
2151	3,33264,04104	20,18566
2152	3,33284,22670	20,17628
2153	3,33304,40298	20,16672
2154	3,33324,56970	20,15775
2155	3,33344,72745	20,14820
2156	3,33364,87565	20,13886
2157	3,33385,01451	20,12952
2158	3,33405,14403	20,12020
2159	3,33425,26423	20,11089
2160	3,33445,37512	20,10157

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
2161	3,33465,47669	20,09227	2191	3,34064,23776	19,81722
2162	3,33485,56896	20,08298	2192	3,34084,05498	19,80819
2163	3,33505,65194	20,07370	2193	3,34103,86317	19,79915
2164	3,33525,72564	20,06443	2194	3,34123,66232	19,79014
2165	3,33545,79007	20,05516	2195	3,34143,45246	19,78112
2166	3,33565,84523	20,04590	2196	3,34163,23358	19,77211
2167	3,33585,89113	20,03666	2197	3,34183,00569	19,76312
2168	3,33605,92779	20,02741	2198	3,34202,76881	19,75413
2169	3,33625,95520	20,01818	2199	3,34222,52294	19,74514
2170	3,33645,97338	20,00897	2200	3,34242,26808	19,73618
2171	3,33665,98235	19,99974	2201	3,34262,00426	19,72720
2172	3,33685,98209	19,99054	2202	3,34281,73146	19,71826
2173	3,33705,97263	19,98135	2203	3,34301,44972	19,70930
2174	3,33725,95398	19,97215	2204	3,34321,15902	19,70036
2175	3,33745,92613	19,96297	2205	3,34340,85938	19,69143
2176	3,33765,88910	19,95380	2206	3,34360,55081	19,68251
2177	3,33785,84290	19,94464	2207	3,34380,23332	19,67359
2178	3,33805,78754	19,93548	2208	3,34399,90691	19,66468
2179	3,33825,72302	19,92634	2209	3,34419,57159	19,65578
2180	3,33845,64936	19,91720	2210	3,34439,22737	19,64689
2181	3,33865,56656	19,90807	2211	3,34458,87426	19,63800
2182	3,33885,47463	19,89894	2212	3,34478,51226	19,62913
2183	3,33905,37357	19,88983	2213	3,34498,14139	19,62026
2184	3,33925,26340	19,88073	2214	3,34517,76165	19,61141
2185	3,33945,14413	19,87163	2215	3,34537,37306	19,60255
2186	3,33965,01576	19,86254	2216	3,34556,97561	19,59370
2187	3,33984,87830	19,85347	2217	3,34576,56931	19,58487
2188	3,34004,73177	19,84439	2218	3,34596,15418	19,57604
2189	3,34024,57616	19,83532	2219	3,34615,73022	19,56723
2190	3,34044,41148	19,82628	2220	3,34635,29745	19,55840

N.	Logarithmi	Differ.
2221	3,34654,85585	19,54961
2222	3,34674,40546	19,54081
2223	3,34693,94627	19,53202
2224	3,34713,47829	19,52324
2225	3,34733,00153	19,51447
2226	3,34752,51600	19,50570
2227	3,34772,02170	19,49695
2228	3,34791,51865	19,48820
2229	3,34811,00685	19,47945
2230	3,34830,48630	19,47073
2231	3,34849,95703	19,46200
2232	3,34869,41903	19,45328
2233	3,34888,87231	19,44457
2234	3,34908,31688	19,43587
2235	3,34927,75275	19,42717
2236	3,34947,17992	19,41849
2237	3,34966,59841	19,40981
2238	3,34986,00822	19,40114
2239	3,35005,40936	19,39247
2240	3,35024,80183	19,38382
2241	3,35044,18565	19,37518
2242	3,35063,56083	19,36653
2243	3,35082,92736	19,35790
2244	3,35102,28526	19,34927
2245	3,35121,63453	19,34066
2246	3,35140,97519	19,33205
2247	3,35160,30724	19,32345
2248	3,35179,63069	19,31485
2249	3,35198,94554	19,30627
2250	3,35218,25181	19,29769

N.	Logarithmi	Differ.
2251	3,35237,54950	19,28912
2252	3,35256,83862	19,28055
2253	3,35276,11917	19,27200
2254	3,35295,39117	19,26345
2255	3,35314,65462	19,25491
2256	3,35333,90953	19,24638
2257	3,35353,15591	19,23785
2258	3,35372,39376	19,22933
2259	3,35391,62309	19,22082
2260	3,35410,84391	19,21232
2261	3,35430,05623	19,20383
2262	3,35449,26006	19,19534
2263	3,35468,45540	19,18685
2264	3,35487,64225	19,17838
2265	3,35506,82063	19,16992
2266	3,35525,99055	19,16146
2267	3,35545,15201	19,15301
2268	3,35564,30502	19,14457
2269	3,35583,44959	19,13613
2270	3,35602,58572	19,12770
2271	3,35621,71342	19,11928
2272	3,35640,83270	19,14087
2273	3,35659,94357	19,10247
2274	3,35679,04604	19,09406
2275	3,35698,14010	19,08565
2276	3,35717,22577	19,07725
2277	3,35736,30306	19,06891
2278	3,35755,37197	19,06055
2279	3,35774,43252	19,05218
2280	3,35793,48470	19,04381

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
2281	3,35812,52853	19,03548	2311	3,36379,99455	18,78842
2282	3,35831,56401	19,02714	2312	3,36398,78297	18,78031
2283	3,35850,59115	19,01881	2313	3,36417,56328	18,77218
2284	3,35869,60996	19,01048	2314	3,36436,33546	18,76408
2285	3,35888,62044	19,00217	2315	3,36455,09954	18,75597
2286	3,35907,62261	18,99385	2316	3,36473,85551	18,74787
2287	3,35926,61646	18,98555	2317	3,36492,60338	18,73978
2288	3,35945,60201	18,97726	2318	3,36511,34316	18,73170
2289	3,35964,57927	18,96896	2319	3,36530,07486	18,72363
2290	3,35983,54823	18,96069	2320	3,36548,79849	18,71556
2291	3,36002,50892	18,95241	2321	3,36567,51405	18,70749
2292	3,36021,46133	18,94414	2322	3,36586,22154	18,69944
2293	3,36040,40547	18,93589	2323	3,36604,92098	18,69139
2294	3,36059,34136	18,92763	2324	3,36623,61237	18,68335
2295	3,36078,26899	18,91938	2325	3,36642,29572	18,67532
2296	3,36097,18837	18,91115	2326	3,36660,97104	18,66729
2297	3,36116,09952	18,90292	2327	3,36679,63833	18,65927
2298	3,36135,00244	18,89469	2328	3,36698,29760	18,65125
2299	3,36153,89713	18,88647	2329	3,36716,94885	18,64325
2300	3,36172,78360	18,87827	2330	3,36735,59210	18,63525
2301	3,36191,66187	18,87006	2331	3,36754,22735	18,62726
2302	3,36210,53193	18,86187	2332	3,36772,85461	18,61927
2303	3,36229,39380	18,85368	2333	3,36791,47388	18,61129
2304	3,36248,24748	18,84549	2334	3,36810,08517	18,60332
2305	3,36267,09297	18,83733	2335	3,36828,68849	18,59535
2306	3,36285,93030	18,82915	2336	3,36847,28384	18,58740
2307	3,36304,75945	18,82100	2337	3,36865,87124	18,57944
2308	3,36323,58045	18,81284	2338	3,36884,45068	18,57150
2309	3,36342,39329	18,80470	2339	3,36903,02218	18,56356
2310	3,36361,19799	18,79656	2340	3,36921,58574	18,55563

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
2341	3,36940,14137	18,54770	2371	3,37493,15540	18,31307
2342	3,36958,68907	18,53979	2372	3,37511,46847	18,30535
2343	3,36977,22886	18,53187	2373	3,37529,77382	18,29764
2344	3,36995,76073	18,52398	2374	3,37548,07146	18,28994
2345	3,37014,28471	18,51607	2375	3,37566,36140	18,28223
2346	3,37032,80078	18,50818	2376	3,37584,64363	18,27454
2347	3,37051,30896	18,50030	2377	3,37602,91817	18,26686
2348	3,37069,80926	18,49242	2378	3,37621,18503	18,25917
2349	3,37088,30168	18,48455	2379	3,37639,44420	18,25151
2350	3,37106,78623	18,47668	2380	3,37657,69571	18,24383
2351	3,37125,26291	18,46883	2381	3,37675,93954	18,23617
2352	3,37143,73174	18,46098	2382	3,37694,17571	18,22852
2353	3,37162,19272	18,45313	2383	3,37712,40423	18,22088
2354	3,37180,64585	18,44530	2384	3,37730,62511	18,21323
2355	3,37199,09115	18,43746	2385	3,37748,83834	18,20559
2356	3,37217,52861	18,42964	2386	3,37767,04393	18,19797
2357	3,37235,95825	18,42183	2387	3,37785,24190	18,19035
2358	3,37254,38008	18,41401	2388	3,37803,43225	18,18272
2359	3,37272,79409	18,40621	2389	3,37821,61497	18,17512
2360	3,37291,20030	18,39841	2390	3,37839,79009	18,16752
2361	3,37309,59871	18,39062	2391	3,37857,95761	18,15992
2362	3,37327,98933	18,38283	2392	3,37876,11753	18,15233
2363	3,37346,37216	18,37506	2393	3,37894,26986	18,14475
2364	3,37364,74722	18,36729	2394	3,37912,41461	18,13717
2365	3,37383,11451	18,35952	2395	3,37930,55178	18,12959
2366	3,37401,47403	18,35176	2396	3,37948,68137	18,12203
2367	3,37419,82579	18,34402	2397	3,37966,80340	18,11448
2368	3,37438,16981	18,33626	2398	3,37984,91788	18,10692
2369	3,37456,50607	18,32853	2399	3,38003,02480	18,09937
2370	3,37474,83460	18,32080	2400	3,38021,12417	18,09184

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
2401	3,38039,21601	18,08430	2431	3,38578,49588	17,86118
2402	3,38057,30031	18,07677	2432	3,38596,35706	17,85383
2403	3,38075,37708	18,06925	2433	3,38614,21089	17,84650
2404	3,38093,44633	18,06174	2434	3,38632,05739	17,83917
2405	3,38111,50807	18,05423	2435	3,38649,89656	17,83184
2406	3,38129,56230	18,04673	2436	3,38667,72840	17,82452
2407	3,38147,60903	18,03923	2437	3,38685,55292	17,81721
2408	3,38165,64826	18,03174	2438	3,38703,37013	17,80990
2409	3,38183,68000	18,02426	2439	3,38721,18003	17,80260
2410	3,38201,70426	18,01678	2440	3,38738,98263	17,79531
2411	3,38219,72104	18,00931	2441	3,38756,77794	17,78802
2412	3,38237,73035	18,00184	2442	3,38774,56596	17,78074
2413	3,38255,73219	17,99439	2443	3,38792,34670	17,77346
2414	3,38273,72658	17,98693	2444	3,38810,12016	17,76619
2415	3,38291,71351	17,97948	2445	3,38827,88635	17,75892
2416	3,38309,69299	17,97205	2446	3,38845,64527	17,75167
2417	3,38327,66504	17,96461	2447	3,38863,39694	17,74441
2418	3,38345,62965	17,95719	2448	3,38881,14135	17,73716
2419	3,38363,58684	17,94976	2449	3,38898,87851	17,72993
2420	3,38381,53660	17,94234	2450	3,38916,60844	17,72269
2421	3,38399,47894	17,93494	2451	3,38934,33113	17,71545
2422	3,38417,41388	17,92753	2452	3,38952,04658	17,70824
2423	3,38435,34141	17,92014	2453	3,38969,75482	17,70102
2424	3,38453,26155	17,91274	2454	3,38987,45584	17,69381
2425	3,38471,17429	17,90536	2455	3,39005,14965	17,68660
2426	3,38489,07965	17,89798	2456	3,39022,83625	17,67940
2427	3,38506,97763	17,89061	2457	3,39040,51565	17,67221
2428	3,38524,86824	17,88324	2458	3,39058,18786	17,66501
2429	3,38542,75148	17,87588	2459	3,39075,85287	17,65784
2430	3,38560,62736	17,86852	2460	3,39093,51071	17,65066

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
2461	3,39111,16137	17,64349	2491	3,39637,37275	17,43105
2462	3,39128,80486	17,63632	2492	3,39654,80380	17,42405
2463	3,39146,44118	17,62917	2493	3,39672,22785	17,41706
2464	3,39164,07035	17,62201	2494	3,39689,64491	17,41009
2465	3,39181,69236	17,61487	2495	3,39707,05500	17,40310
2466	3,39199,30723	17,60772	2496	3,39724,45810	17,39614
2467	3,39216,91495	17,60059	2497	3,39741,85424	17,38916
2468	3,39234,51554	17,59345	2498	3,39759,24340	17,38221
2469	3,39252,10899	17,58634	2499	3,39776,62561	17,37526
2470	3,39269,69533	17,57921	2500	3,39794,00087	17,36830
2471	3,39287,27454	17,57210	2501	3,39811,36917	17,36137
2472	3,39304,84664	17,56500	2502	3,39828,73054	17,35442
2473	3,39322,41164	17,55789	2503	3,39846,08496	17,34749
2474	3,39339,96953	17,55080	2504	3,39863,43245	17,34057
2475	3,39357,52033	17,54370	2505	3,39880,77302	17,33365
2476	3,39375,06403	17,53663	2506	3,39898,10667	17,32673
2477	3,39392,60066	17,52954	2507	3,39915,43340	17,31982
2478	3,39410,13020	17,52248	2508	3,39932,75322	17,31291
2479	3,39427,65268	17,51540	2509	3,39950,06613	17,30602
2480	3,39445,16808	17,50835	2510	3,39967,37215	17,29912
2481	3,39462,67643	17,50129	2511	3,39984,67127	17,29224
2482	3,39480,17772	17,49424	2512	3,40001,96351	17,28535
2483	3,39497,67196	17,48719	2513	3,40019,24886	17,27847
2484	3,39515,15915	17,48016	2514	3,40036,52733	17,27161
2485	3,39532,63931	17,47312	2515	3,40053,79894	17,26474
2486	3,39550,11243	17,46610	2516	3,40071,06368	17,25787
2487	3,39567,57853	17,45907	2517	3,40088,32155	17,25103
2488	3,39585,03760	17,45206	2518	3,40105,57258	17,24417
2489	3,39602,48966	17,44505	2519	3,40122,81675	17,23733
2490	3,39619,93471	17,43804	2520	3,40140,05408	17,230[illegible]

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
2521	3,40157,28457	17,22365	2551	3,40671,04586	17,02114
2522	3,40174,50822	17,21683	2552	3,40688,06700	17,01448
2523	3,40191,72505	17,21001	2553	3,40705,08148	17,00781
2524	3,40208,93506	17,20318	2554	3,40722,08929	17,00116
2525	3,40226,13825	17,19637	2555	3,40739,09045	16,99450
2526	3,40243,33462	17,18957	2556	3,40756,08495	16,98785
2527	3,40260,52419	17,18277	2557	3,40773,07280	16,98121
2528	3,40277,70696	17,17597	2558	3,40790,05401	16,97458
2529	3,40294,88293	17,16919	2559	3,40807,02859	16,96794
2530	3,40312,05212	17,16240	2560	3,40823,99653	16,96132
2531	3,40329,21452	17,15561	2561	3,40840,95785	16,95469
2532	3,40346,37013	17,14885	2562	3,40857,91254	16,94808
2533	3,40363,51898	17,24207	2563	3,40874,86062	16,94146
2534	3,40380,76105	17,03532	2564	3,40891,80208	16,93486
2535	3,40397,79637	17,12855	2565	3,40908,73694	16,92826
2536	3,40414,92492	17,12180	2566	3,40925,66520	16,92167
2537	3,40432,04672	17,11506	2567	3,40942,58687	16,91507
2538	3,40449,16178	17,10831	2568	3,40959,50194	16,90849
2539	3,40466,27009	17,10157	2569	3,40976,41043	16,90190
2540	3,40483,37166	17,09485	2570	3,40993,31233	16,89533
2541	3,40500,46651	17,08811	2571	3,41010,20766	16,88877
2542	3,40517,55462	17,08140	2572	3,41027,09643	16,88219
2543	3,40534,63602	17,07468	2573	3,41043,97862	16,87564
2544	3,40551,61070	17,06797	2574	3,41060,85426	16,86908
2545	3,40568,77867	17,06126	2575	3,41077,72334	16,86253
2546	3,40585,83993	17,05457	2576	3,41094,58587	16,85599
2547	3,40602,89450	17,04787	2577	3,41111,44186	16,84944
2548	3,40619,94237	17,04118	2578	3,41128,29130	16,84291
2549	3,40636,98355	17,03449	2579	3,41145,13421	16,83639
2550	3,40654,01804	17,02782	2580	3,41161,97060	16,82985

N.	Logarithmi	Differ.
2581	3,41178,80045	16,82334
2582	3,41195,62379	16,81683
2583	3,41212,44062	16,81031
2584	3,41229,25093	16,80381
2585	3,41246,05474	16,79731
2586	3,41262,85205	16,79082
2587	3,41279,64287	16,78433
2588	3,41296,42720	16,77784
2589	3,41313,20504	16,77137
2590	3,41329,97641	16,76489
2591	3,41346,74130	16,75842
2592	3,41363,49972	16,75196
2593	3,41380,25168	16,74549
2594	3,41396,99717	16,73905
2595	3,41413,73622	16,73259
2596	3,41430,46881	16,72615
2597	3,41447,19496	16,71971
2598	3,41463,91467	16,71328
2599	3,41480,62795	16,70685
2600	3,41497,33480	16,70042
2601	3,41514,03522	16,69400
2602	3,41530,72922	16,68759
2603	3,41547,41681	16,68118
2604	3,41564,09799	16,67477
2605	3,41580,77276	16,66838
2606	3,41597,44114	16,66198
2607	3,41614,10312	16,65559
2608	3,41630,75871	16,64920
2609	3,41647,40791	16,64282
2610	3,41664,05073	16,63645

N.	Logarithmi	Differ.
2611	3,41680,68718	16,63008
2612	3,41697,31726	16,62372
2613	3,41713,94097	16,61735
2614	3,41730,55832	16,61100
2615	3,41747,16932	16,60465
2616	3,41763,77397	16,59829
2617	3,41780,37226	16,59196
2618	3,41796,96422	16,58562
2619	3,41813,54984	16,57929
2620	3,41830,12913	16,57296
2621	3,41846,70209	16,56665
2622	3,41863,26874	16,56032
2623	3,41879,82906	16,55401
2624	3,41896,38307	16,54770
2625	3,41912,93077	16,54141
2626	3,41929,47218	16,53512
2627	3,41946,00728	16,52881
2628	3,41962,53609	16,52252
2629	3,41979,05861	16,51624
2630	3,41995,57485	16,50996
2631	3,42012,08481	16,50368
2632	3,42028,58849	16,49740
2633	3,42045,08591	16,49115
2634	3,42061,57706	16,48489
2635	3,42078,06195	16,47864
2636	3,42094,54059	16,47239
2637	3,42111,01298	16,46614
2638	3,42127,47912	16,45990
2639	3,42143,93902	16,45367
2640	3,42160,39269	16,44743

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
2641	3,42176,84012	16,44121	2671	3,42667,38880	16,25658
2642	3,42193,28133	16,43498	2672	3,42683,64538	16,25050
2643	3,42209,71631	16,42877	2673	3,42699,89588	16,24441
2644	3,42226,14508	16,42256	2674	3,42716,14029	16,23835
2645	3,42242,56764	16,41635	2675	3,42732,37864	16,23227
2646	3,42258,98399	16,41014	2676	3,42748,61091	16,22621
2647	3,42275,39413	16,40395	2677	3,42764,83712	16,22015
2648	3,42291,79808	16,39775	2678	3,42781,05727	16,21409
2649	3,42308,19583	16,39156	2679	3,42797,27136	16,20804
2650	3,42324,58739	16,38538	2680	3,42813,47940	16,20200
2651	3,42340,97277	16,37920	2681	3,42829,68140	16,19595
2652	3,42357,35197	16,37303	2682	3,42845,87735	16,18992
2653	3,42373,72500	16,36685	2683	3,42862,06727	16,18388
2654	3,42390,09185	16,36069	2684	3,42878,25115	16,17785
2655	3,42406,45254	16,35453	2685	3,42894,42900	16,17183
2656	3,42422,80707	16,34837	2686	3,42910,60083	16,16581
2657	3,42439,15544	16,34222	2687	3,42926,76664	16,15980
2658	3,42455,49766	16,33607	2688	3,42942,92644	16,15378
2659	3,42471,83373	16,32993	2689	3,42959,08022	16,14778
2660	3,42488,16366	16,32380	2690	3,42975,22800	16,14178
2661	3,42504,48746	16,31765	2691	3,42991,36978	16,13578
2662	3,42520,80511	16,31153	2692	3,43007,50556	16,12978
2663	3,42537,11664	16,30541	2693	3,43023,63534	16,12380
2664	3,42553,42205	16,29929	2694	3,43039,75914	16,11781
2665	3,42569,72134	16,29317	2695	3,43055,87695	16,11184
2666	3,42586,01451	16,28706	2696	3,43071,98879	16,10586
2667	3,42602,30157	16,28095	2697	3,43088,09465	16,09988
2668	3,42618,58252	16,27486	2698	3,43104,19453	16,09393
2669	3,42634,85738	16,26876	2699	3,43120,28846	16,08796
2670	3,42651,12614	16,26266	2700	3,43136,37642	16,08200

N.	Logarithmi	Differ.
2701	3,43152,45842	16,07605
2702	3,43168,53447	16,07010
2703	3,43184,60457	16,06416
2704	3,43200,66873	16,05821
2705	3,43216,72694	16,05229
2706	3,43232,77923	16,04635
2707	3,43248,82558	16,04042
2708	3,43264,86600	16,03450
2709	3,43280,90050	16,02859
2710	3,43296,92909	16,02267
2711	3,43312,95176	16,01676
2712	3,43328,96852	16,01086
2713	3,43344,97938	16,00495
2714	3,43360,98433	15,99906
2715	3,43376,98339	15,99317
2716	3,43392,97656	15,98728
2717	3,43408,96384	15,98140
2718	3,43424,94524	15,97552
2719	3,43440,92076	15,96964
2720	3,43456,89040	15,96378
2721	3,43472,85418	15,95791
2722	3,43488,81209	15,95204
2723	3,43504,76413	15,94619
2724	3,43520,71032	15,94034
2725	3,43536,65066	15,93449
2726	3,43552,58515	15,92864
2727	3,43568,51379	15,92281
2728	3,43584,43660	15,91697
2729	3,43600,35357	15,91113
2730	3,43616,26470	15,90531

N.	Logarithmi	Differ.
2731	3,43632,17001	15,89949
2732	3,43648,06950	15,89367
2733	3,43663,96317	15,88785
2734	3,43679,85102	15,88205
2735	3,43695,73307	15,87623
2736	3,43711,60930	15,87044
2737	3,43727,47974	15,86464
2738	3,43743,34438	15,85885
2739	3,43759,20323	15,85305
2740	3,43775,05628	15,84727
2741	3,43790,90355	15,84150
2742	3,43806,74505	15,83571
2743	3,43822,58076	15,82994
2744	3,43838,41070	15,82418
2745	3,43854,23488	15,81841
2746	3,43870,05329	15,81265
2747	3,43885,86594	15,80690
2748	3,43901,67284	15,80114
2749	3,43917,47398	15,79540
2750	3,43933,26938	15,78966
2751	3,43949,05904	15,78392
2752	3,43964,84296	15,77818
2753	3,43980,62114	15,77245
2754	3,43996,39359	15,76673
2755	3,44012,16032	15,76100
2756	3,44027,92132	15,75529
2757	3,44043,67661	15,74957
2758	3,44059,42618	15,74387
2759	3,44075,17005	15,73816
2760	3,44090,90821	15,73245

N.	Logarithmi	Differ.
2761	3,44106,64066	15,72676
2762	3,44122,36742	15,72107
2763	3,44138,08849	15,71538
2764	3,44153,80387	15,70969
2765	3,44169,51356	15,70402
2766	3,44185,21758	15,69833
2767	3,44200,91591	15,69267
2768	3,44216,60858	15,68699
2769	3,44232,29557	15,68134
2770	3,44247,97691	15,67567
2771	3,44263,65258	15,67001
2772	3,44279,32259	15,66437
2773	3,44294,98696	15,65871
2774	3,44310,64567	15,65308
2775	3,44326,29875	15,64743
2776	3,44341,94618	15,64180
2777	3,44357,58798	15,63616
2778	3,44373,22414	15,63054
2779	3,44388,85468	15,62491
2780	3,44404,47959	15,61930
2781	3,44420,09889	15,61368
2782	3,44435,71257	15,60806
2783	3,44451,32063	15,60246
2784	3,44466,92309	15,59686
2785	3,44482,51995	15,59126
2786	3,44498,11121	15,58566
2787	3,44513,69687	15,58007
2788	3,44529,27694	15,57449
2789	3,44544,85143	15,56890
2790	3,44560,42033	15,56332

N.	Logarithmi	Differ.
2791	3,44575,98365	15,55775
2792	3,44591,54140	15,55217
2793	3,44607,09357	15,54661
2794	3,44622,64018	15,54104
2795	3,44638,18122	15,53549
2796	3,44653,71671	15,52993
2797	3,44669,24664	15,52438
2798	3,44684,77102	15,51883
2799	3,44700,28985	15,51328
2800	3,44715,80313	15,50775
2801	3,44731,31088	15,50221
2802	3,44746,81309	15,49669
2803	3,44762,30978	15,49115
2804	3,44777,80093	15,48563
2805	3,44793,28656	15,48011
2806	3,44808,76667	15,47459
2807	3,44824,24126	15,46909
2808	3,44839,71035	15,46357
2809	3,44855,17392	15,45807
2810	3,44870,63199	15,45257
2811	3,44886,08456	15,44707
2812	3,44901,53163	15,44159
2813	3,44916,97322	15,43609
2814	3,44932,40931	15,43061
2815	3,44947,83992	15,42513
2816	3,44963,26505	15,41965
2817	3,44978,68470	15,41418
2818	3,44994,09888	15,40871
2819	3,45009,50759	15,40324
2820	3,45024,91083	15,39779

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
2821	3,45040,30862	15,39232	2851	3,45499,72173	15,23039
2822	3,45055,70094	15,38687	2852	3,45514,95212	15,22505
2823	3,45071,08781	15,38143	2853	3,45530,17717	15,21971
2824	3,45086,46924	15,37598	2854	3,45545,39688	15,21438
2825	3,45101,84522	15,37053	2855	3,45560,61126	15,20905
2826	3,45117,21575	15,36510	2856	3,45575,82031	15,20373
2827	3,45132,58085	15,35966	2857	3,45591,02404	15,19841
2828	3,45147,94051	15,35424	2858	3,45606,22245	15,19309
2829	3,45163,29475	15,34880	2859	3,45621,41554	15,18777
2830	3,45178,64355	15,34339	2860	3,45636,60331	15,18247
2831	3,45193,98694	15,33796	2861	3,45651,78578	15,17716
2832	3,45209,32490	15,33255	2862	3,45666,96294	15,17186
2833	3,45224,65745	15,32714	2863	3,45682,13480	15,16656
2834	3,45239,98459	15,32173	2864	3,45697,30136	15,16127
2835	3,45255,30632	15,31633	2865	3,45712,46263	15,15598
2836	3,45270,62265	15,31093	2866	3,45727,61861	15,15068
2837	3,45285,93358	15,30553	2867	3,45742,76929	15,14541
2838	3,45301,23911	15,30014	2868	3,45757,91470	15,14012
2839	3,45316,53925	15,29475	2869	3,45773,05482	15,13485
2840	3,45331,83400	15,28937	2870	3,45788,18967	15,12958
2841	3,45347,12337	15,28399	2871	3,45803,31925	15,12431
2842	3,45362,40736	15,27861	2872	3,45818,44356	15,11904
2843	3,45377,68597	15,27324	2873	3,45833,56260	15,11378
2844	3,45392,95921	15,26786	2874	3,45848,67638	15,10852
2845	3,45408,22707	15,26250	2875	3,45863,78490	15,10327
2846	3,45423,48957	15,25714	2876	3,45878,88817	15,09802
2847	3,45438,74671	15,25179	2877	3,45893,98619	15,09277
2848	3,45453,99850	15,24642	2878	3,45909,07896	15,08753
2849	3,45469,24492	15,24108	2879	3,45924,16649	15,08229
2850	3,45484,48600	15,23573	2880	3,45939,24878	15,07705

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
2881	3,45954,32583	15,07182	2911	3,46404,22054	14,91652
2882	3,45969,39765	15,06659	2912	3,46419,13706	14,91140
2883	3,45984,46424	15,06136	2913	3,46434,04846	14,90628
2884	3,45999,52560	15,05615	2914	3,46448,95474	14,90117
2885	3,46014,58175	15,05093	2915	3,46463,85591	14,89605
2886	3,46029,63268	15,04571	2916	3,46478,75196	14,89095
2887	3,46044,67839	15,04050	2917	3,46493,64291	14,88585
2888	3,46059,71889	15,03529	2918	3,46508,52876	14,88074
2889	3,46074,75418	15,03010	2919	3,46523,40950	14,87564
2890	3,46089,78428	15,02489	2920	3,46538,28514	14,87056
2891	3,46104,80917	15,01969	2921	3,46553,15570	14,86546
2892	3,46119,82886	15,01450	2922	3,46568,02116	14,86038
2893	3,46134,84336	15,00932	2923	3,46582,88154	14,85529
2894	3,46149,85268	15,00413	2924	3,46597,73683	14,85021
2895	3,46164,85681	14,99894	2925	3,46612,58704	14,84514
2896	3,46179,85575	14,99377	2926	3,46627,43218	14,84006
2897	3,46194,84952	14,98859	2927	3,46642,27224	14,83500
2898	3,46209,83811	14,98343	2928	3,46657,10724	14,82993
2899	3,46224,82154	14,97825	2929	3,46671,93717	14,82487
2900	3,46239,79979	14,97309	2930	3,46686,76204	14,81980
2901	3,46254,77288	14,96793	2931	3,46701,58184	14,81476
2902	3,46269,74081	14,96277	2932	3,46716,39660	14,80970
2903	3,46284,70358	14,95762	2933	3,46731,20630	14,80465
2904	3,46299,66120	14,95247	2934	3,46746,01095	14,79961
2905	3,46314,61367	14,94733	2935	3,46760,81056	14,79456
2906	3,46329,56100	14,94218	2936	3,46775,60512	14,78953
2907	3,46344,50318	14,93704	2937	3,46790,39465	14,78450
2908	3,46359,44022	14,93190	2938	3,46805,17915	14,77946
2909	3,46374,37212	14,92678	2939	3,46819,95861	14,77443
2910	3,46389,29890	14,92164	2940	3,46834,73304	14,76941

N.	Logarithmi	Differ.
2941	3,46849,50245	14,76439
2942	3,46864,26684	14,75937
2943	3,46879,02621	14,75436
2944	3,46893,78057	14,74934
2945	3,46908,52991	14,74434
2946	3,46923,27425	14,73933
2947	3,46938,01358	14,73434
2948	3,46952,74792	14,72934
2949	3,46967,47726	14,72434
2950	3,46982,20160	14,71935
2951	3,46996,92095	14,71437
2952	3,47011,63532	14,70938
2953	3,47026,34470	14,70440
2954	3,47041,04910	14,69942
2955	3,47055,74852	14,69445
2956	3,47070,44297	14,68948
2957	3,47085,13245	14,68452
2958	3,47099,81697	14,67955
2959	3,47114,49652	14,67459
2960	3,47129,17111	14,66963
2961	3,47143,84074	14,66468
2962	3,47158,50542	14,65973
2963	3,47173,16515	14,65478
2964	3,47187,81993	14,64984
2965	3,47202,46977	14,64490
2966	3,47217,11467	14,63996
2967	3,47231,75463	14,63503
2968	3,47246,38966	14,63010
2969	3,47261,01976	14,62517
2970	3,47275,64493	14,62025

N.	Logarithmi	Differ.
2971	3,47290,26518	14,61533
2972	3,47304,88051	14,61041
2973	3,47319,49092	14,60550
2974	3,47334,09642	14,60059
2975	3,47348,69701	14,59568
2976	3,47363,29269	14,59077
2977	3,47377,88346	14,58588
2978	3,47392,46934	14,58098
2979	3,47407,05032	14,57609
2980	3,47421,62641	14,57119
2981	3,47436,19760	14,56631
2982	3,47450,76391	14,56143
2983	3,47465,32534	14,55654
2984	3,47479,88188	14,55167
2985	3,47494,43355	14,54679
2986	3,47508,98034	14,54192
2987	3,47523,52226	14,53705
2988	3,47538,05931	14,53219
2989	3,47552,59150	14,52733
2990	3,47567,11883	14,52247
2991	3,47581,64130	14,51762
2992	3,47596,15892	14,51276
2993	3,47610,67168	14,50792
2994	3,47625,17960	14,50307
2995	3,47639,68267	14,49823
2996	3,47654,18090	14,49339
2997	3,47668,67429	14,48856
2998	3,47683,16285	14,48373
2999	3,47697,64658	14,47889
3000	3,47712,12547	14,47407

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
3001	3,47726,59954	14,46925	3031	3,48158,59364	14,32606
3002	3,47741,06879	14,46443	3032	3,48172,91970	14,32133
3003	3,47755,53322	14,45961	3033	3,48187,24103	14,31662
3004	3,47769,99283	14,45480	3034	3,48201,55765	14,31189
3005	3,47784,44763	14,45000	3035	3,48215,86954	14,30718
3006	3,47798,89763	14,44518	3036	3,48230,17672	14,30247
3007	3,47813,34281	14,44038	3037	3,48244,47919	14,29776
3008	3,47827,78319	14,43558	3038	3,48258,77695	14,29306
3009	3,47842,21877	14,43079	3039	3,48273,07001	14,28835
3010	3,47856,64956	14,42599	3040	3,48287,35836	14,28365
3011	3,47871,07555	14,42120	3041	3,48301,64201	14,27896
3012	3,47885,49675	14,41642	3042	3,48315,92097	14,27427
3013	3,47899,91317	14,41163	3043	3,48330,19524	14,26957
3014	3,47914,32480	14,40685	3044	3,48344,46481	14,26489
3015	3,47928,73165	14,40207	3045	3,48358,72970	14,26020
3016	3,47943,13372	14,39730	3046	3,48372,98990	14,25552
3017	3,47957,53102	14,39252	3047	3,48387,24542	14,25085
3018	3,47971,92354	14,38776	3048	3,48401,49627	14,24617
3019	3,47986,31130	14,38300	3049	3,48415,74244	14,24149
3020	3,48000,69430	14,37823	3050	3,48429,98393	14,23683
3021	3,48015,07253	14,37347	3051	3,48444,22076	14,23217
3022	3,48029,44600	14,36872	3052	3,48458,45293	14,22750
3023	3,48043,81472	14,36396	3053	3,48472,68043	14,22284
3024	3,48058,17868	14,35922	3054	3,48486,90327	14,21819
3025	3,48072,53790	14,35447	3055	3,48501,12146	14,21353
3026	3,48086,89237	14,34973	3056	3,48515,33499	14,20888
3027	3,48101,24210	14,34498	3057	3,48529,54387	14,20424
3028	3,48115,58708	14,34025	3058	3,48543,74811	14,19959
3029	3,48129,92733	14,33552	3059	3,48557,94770	14,19495
3030	3,48144,26285	14,33079	3060	3,48572,14265	14,19031

N.	Logarithmi	Differ.
3061	3,48586,33296	14,18568
3062	3,48600,51864	14,18104
3063	3,48614,69968	14,17642
3064	3,48628,87610	14,17179
3065	3,48643,04789	14,16716
3066	3,48657,21505	14,16255
3067	3,48671,37760	14,15793
3068	3,48685,53553	14,15331
3069	3,48699,68884	14,14871
3070	3,48713,83755	14,14409
3071	3,48727,98164	14,13950
3072	3,48742,12114	14,13489
3073	3,48756,25603	14,13029
3074	3,48770,38632	14,12569
3075	3,48784,51201	14,12110
3076	3,48798,63311	14,11651
3077	3,48812,74962	14,11193
3078	3,48826,86155	14,10734
3079	3,48840,96889	14,10276
3080	3,48855,07165	14,09818
3081	3,48869,16983	14,09361
3082	3,48883,26344	14,08903
3083	3,48897,35247	14,08447
3084	3,48911,43694	14,07990
3085	3,48925,51684	14,07533
3086	3,48939,59217	14,07078
3087	3,48953,66295	14,06622
3088	3,48967,72917	14,06166
3089	3,48981,79083	14,05711
3090	3,48995,84794	14,05257

N.	Logarithmi	Differ.
3091	3,49009,90051	14,04801
3092	3,49023,94852	14,04348
3093	3,49037,99200	14,03894
3094	3,49052,03094	14,03440
3095	3,49066,06534	14,02986
3096	3,49080,09520	14,02534
3097	3,49094,12054	14,02080
3098	3,49108,14134	14,01628
3099	3,49122,15762	14,01176
3100	3,49136,16938	14,00724
3101	3,49150,17662	14,00273
3102	3,49164,17935	13,99821
3103	3,49178,17756	13,9937[illegible]
3104	3,49192,17126	13,98919
3105	3,49206,16045	13,98469
3106	3,49220,14514	13,98019
3107	3,49234,12533	13,97568
3108	3,49248,10101	13,97119
3109	3,49262,07220	13,9667[illegible]
3110	3,49276,03890	13,962[illegible]
3111	3,49290,00111	13,957[illegible]
3112	3,49303,95883	13,95[illegible]
3113	3,49317,91207	13,94[illegible]
3114	3,49331,86082	13,94[illegible]
3115	3,49345,80510	13,939[illegible]
3116	3,49359,74490	13,935[illegible]
3117	3,49373,68023	13,930[illegible]
3118	3,49387,61109	13,926[illegible]
3119	3,49401,53748	13,921[illegible]
3120	3,49415,45940	13,917[illegible]

N.	Logarithmi	Differ.
3121	3,49429,37687	13,91300
3122	3,49443,28987	13,90855
3123	3,49457,19842	13,90410
3124	3,49471,10252	13,89965
3125	3,49485,00217	13,89520
3126	3,49498,89737	13,89075
3127	3,49512,78812	13,88632
3128	3,49526,67444	13,88187
3129	3,49540,55631	13,87744
3130	3,49554,43375	13,87301
3131	3,49568,30676	13,86858
3132	3,49582,17534	13,86415
3133	3,49596,03949	13,85972
3134	3,49609,89921	13,85531
3135	3,49623,75452	13,85088
3136	3,49637,60540	13,84647
3137	3,49651,45187	13,84206
3138	3,49665,29393	13,83764
3139	3,49679,13157	13,83324
3140	3,49692,96481	13,82883
3141	3,49706,79364	13,82443
3142	3,49720,61807	13,82003
3143	3,49734,43810	13,81564
3144	3,49748,25374	13,81124
3145	3,49762,06498	13,80685
3146	3,49775,87183	13,60246
3147	3,49789,67429	13,79808
3148	3,49803,47237	13,79369
3149	3,49817,26606	13,78932
3150	3,49831,05538	13,78494
3151	3,49844,84032	13,78056
3152	3,49858,62088	13,77619
3153	3,49872,39707	13,77183
3154	3,49886,16890	13,76746
3155	3,49899,93636	13,76309
3156	3,49913,69945	13,75874
3157	3,49927,45819	13,75438
3158	3,49941,21257	13,75002
3159	3,49954,96259	13,74567
3160	3,49968,70826	13,74132
3161	3,49982,44958	13,73698
3162	3,49996,18656	13,73263
3163	3,50009,91919	13,72829
3164	3,50023,64748	13,72396
3165	3,50037,37144	13,71961
3166	3,50051,09105	13,71529
3167	3,50064,80634	13,71095
3168	3,50078,51729	13,70663
3169	3,50092,22392	13,70230
3170	3,50105,92622	13,69798
3171	3,50119,62420	13,69366
3172	3,50133,31786	13,68935
3173	3,50147,00721	13,68503
3174	3,50160,69224	13,68072
3175	3,50174,37296	13,67642
3176	3,50188,04938	13,67210
3177	3,50201,72148	13,66781
3178	3,50215,38929	13,66350
3179	3,50229,05279	13,65921
3180	3,50242,71200	13,65491

N.	Logarithmi	Differ.
3181	3,50256,36691	13,65062
3182	3,50270,01753	13,64633
3183	3,50283,66386	13,64205
3184	3,50297,30591	13,63776
3185	3,50310,94367	13,63348
3186	3,50324,57715	13,62920
3187	3,50338,20635	13,62492
3188	3,50351,83127	13,62065
3189	3,50365,45192	13,61639
3190	3,50379,06831	13,61211
3191	3,50392,68042	13,60785
3192	3,50406,28827	13,60358
3193	3,50419,89185	13,59933
3194	3,50433,49118	13,59507
3195	3,50447,08625	13,59081
3196	3,50460,67706	13,58657
3197	3,50474,26363	13,58231
3198	3,50487,84594	13,57807
3199	3,50501,42401	13,57382
3200	3,50514,99783	13,56958
3201	3,50528,56741	13,56535
3202	3,50542,13276	13,56111
3203	3,50555,69387	13,55687
3204	3,50569,25074	13,55265
3205	3,50582,80339	13,54841
3206	3,50596,35180	13,54419
3207	3,50609,89599	13,53997
3208	3,50623,43596	13,53575
3209	3,50636,97171	13,53153
3210	3,50650,50324	13,52732

N.	Logarithmi	Differ.
3211	3,50664,03056	13,52310
3212	3,50677,55366	13,51890
3213	3,50691,07256	13,51468
3214	3,50704,58724	13,51049
3215	3,50718,09773	13,50628
3216	3,50731,60401	13,50208
3217	3,50745,10609	13,49789
3218	3,50758,60398	13,49369
3219	3,50772,09767	13,48950
3220	3,50785,58717	13,48531
3221	3,50799,07248	13,48113
3222	3,50812,55361	13,47694
3223	3,50826,03055	13,47276
3224	3,50839,50331	13,46859
3225	3,50852,97190	13,46441
3226	3,50866,43631	13,46023
3227	3,50879,89654	13,45607
3228	3,50893,35261	13,45189
3229	3,50906,80450	13,44773
3230	3,50920,25223	13,44357
3231	3,50933,69580	13,43941
3232	3,50947,13521	13,43525
3233	3,50960,57046	13,43110
3234	3,50974,00156	13,42694
3235	3,50987,42850	13,42279
3236	3,51000,85129	13,41865
3237	3,51014,26994	13,41450
3238	3,51027,68444	13,41036
3239	3,51041,09480	13,40622
3240	3,51054,50102	13,40208

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
3241	3,51067,90310	13,39795	3271	3,51468,05441	13,27509
3242	3,51081,30105	13,39382	3272	3,51481,32950	13,27103
3243	3,51094,69487	13,38968	3273	3,51494,60053	13,26698
3244	3,51108,08455	13,38556	3274	3,51507,86751	13,26292
3245	3,51121,47011	13,38144	3275	3,51521,13043	13,25888
3246	3,51134,85155	13,37731	3276	3,51534,38931	13,25483
3247	3,51148,22886	13,37320	3277	3,51547,64414	13,25078
3248	3,51161,60206	13,36907	3278	3,51560,89492	13,24675
3249	3,51174,97113	13,36497	3279	3,51574,14167	13,24270
3250	3,51188,33610	13,36085	3280	3,51587,38437	13,23867
3251	3,51201,69695	13,35674	3281	3,51600,62304	13,23463
3252	3,51215,05369	13,35264	3282	3,51613,85767	13,23060
3253	3,51228,40633	13,34853	3283	3,51627,08827	13,22657
3254	3,51241,75486	13,34443	3284	3,51640,31484	13,22255
3255	3,51255,09929	13,34033	3285	3,51653,53739	13,21852
3256	3,51268,43962	13,33624	3286	3,51666,75591	13,21450
3257	3,51281,77586	13,33214	3287	3,51679,97041	13,21048
3258	3,51295,10800	13,32805	3288	3,51693,18089	13,20646
3259	3,51308,43605	13,32396	3289	3,51706,38735	13,20244
3260	3,51321,76001	13,31987	3290	3,51719,58979	13,19844
3261	3,51335,07988	13,31579	3291	3,51732,78823	13,19442
3262	3,51348,39567	13,31171	3292	3,51745,98265	13,19042
3263	3,51361,70738	13,30763	3293	3,51759,17307	13,18241
3264	3,51375,01501	13,30355	3294	3,51772,35948	13,18361
3265	3,51388,31856	13,29948	3295	3,51785,54189	13,17841
3266	3,51401,61804	13,29541	3296	3,51798,72030	13,17441
3262	3,51414,91345	13,29134	3297	3,51811,89471	13,17042
3268	3,51428,20479	13,28727	3298	3,51825,06513	13,16642
3269	3,51441,49206	13,28321	3299	3,51838,23155	13,16244
3270	3,51454,77527	13,27914	3300	3,51851,39399	13,15844

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
3301	3,51864,55243	13,15446	3331	3,52257,46327	13,03[illegible]
3302	3,51877,70689	13,15048	3332	3,52270,49927	13,03[illegible]
3303	3,51890,85737	13,14649	3333	3,52283,53137	13,02[illegible]
3304	3,51904,00386	13,14252	3334	3,52296,55955	13,02[illegible]
3305	3,51917,14638	13,13854	3335	3,52309,58383	13,02[illegible]
3306	3,51930,28492	13,13457	3336	3,52322,60420	13,01[illegible]
3307	3,51943,41949	13,13060	3337	3,52335,62067	13,01[illegible]
3308	3,51956,55009	13,12663	3338	3,52348,63323	13,00[illegible]
3309	3,51969,67672	13,12266	3339	3,52361,64191	13,00[illegible]
3310	3,51982,79938	13,11870	3340	3,52374,64668	13,00[illegible]
3311	3,51995,91808	13,11473	3341	3,52387,64756	12,99[illegible]
3312	3,52009,03281	13,11078	3342	3,52400,64456	12,99[illegible]
3313	3,52022,14359	13,10682	3343	3,52413,63766	12,98[illegible]
3314	3,52035,25041	13,10286	3344	3,52426,62688	12,98[illegible]
3315	3,52048,35327	13,09892	3345	3,52439,61221	12,98[illegible]
3316	3,52061,45219	13,09496	3346	3,52452,59366	12,97[illegible]
3317	3,52074,54715	13,09102	3347	3,52465,57124	12,97[illegible]
3318	3,52087,63817	13,08707	3348	3,52478,54493	12,96[illegible]
3319	3,52100,72524	13,08313	3349	3,52491,51475	12,96[illegible]
3320	3,52113,80837	13,07919	3350	3,52504,48070	12,96[illegible]
3321	3,52126,88756	13,07525	3351	3,52517,44278	12,95[illegible]
3322	3,52139,96281	13,07132	3352	3,52530,40100	12,95[illegible]
3323	3,52153,03413	13,06738	3353	3,52543,35534	12,95[illegible]
3324	3,52166,10151	13,06345	3354	3,52556,30583	12,94[illegible]
3325	3,52179,16496	13,05953	3355	3,52569,25245	12,94[illegible]
3326	3,52192,22449	13,05560	3356	3,52582,19522	12,93[illegible]
3327	3,52205,28009	13,05167	3357	3,52595,13412	12,93[illegible]
3328	3,52218,33176	13,04776	3358	3,52608,06918	12,93[illegible]
3329	3,52231,27952	13,04383	3359	3,52621,00038	12,92[illegible]
3330	3,52244,42335	13,03992	3360	3,52633,92774	12,92[illegible]

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
3361	3,52646,85125	12,91966	3391	3,53032,77898	12,80538
3362	3,52659,77091	12,91582	3392	3,53045,58436	12,80160
3363	3,52672,68673	12,91198	3393	3,53058,38596	12,79784
3364	3,52685,59871	12,90815	3394	3,53071,18380	12,79406
3365	3,52698,50686	12,90430	3395	3,53083,97786	12,79030
3366	3,52711,41116	12,90048	3396	3,53096,76816	12,78653
3367	3,52724,31164	12,89664	3397	3,53109,55469	12,78276
3368	3,52737,20828	12,89282	3398	3,53122,33745	12,77901
3369	3,52750,10110	12,88899	3399	3,53135,11646	12,77524
3370	3,52762,99009	12,88516	3400	3,53147,89170	12,77149
3371	3,52775,87525	12,88135	3401	3,53160,66319	12,76774
3372	3,52788,75660	12,87752	3402	3,53173,43093	12,76398
3373	3,52801,63412	12,87371	3403	3,53186,19491	12,76023
3374	3,52814,50783	12,86989	3404	3,53198,95514	12,75648
3375	3,52827,37772	12,86608	3405	3,53211,71162	12,75274
3376	3,52840,24380	12,86226	3406	3,53224,46436	12,74900
3377	3,52853,10606	12,85846	3407	3,53237,21336	12,74525
3378	3,52865,96452	12,85466	3408	3,53249,95861	12,74151
3379	3,52878,81918	12,85085	3409	3,53262,70012	12,73778
3380	3,52891,67003	12,84705	3410	3,53275,43790	12,73404
3381	3,52904,51708	12,84325	3411	3,53288,17194	12,73031
3382	3,52917,36033	12,83945	3412	3,53300,90225	12,72658
3383	3,52930,19978	12,83566	3413	3,53313,62883	12,72285
3384	3,52943,03544	12,83186	3414	3,53326,35168	12,71912
3385	3,52955,86730	12,82808	3415	3,53339,07080	12,71540
3386	3,52968,69538	12,82428	3416	3,53351,78620	12,71168
3387	3,52981,51966	12,82051	3417	3,53364,49788	12,70796
3388	3,52994,34017	12,81671	3418	3,53377,20584	12,70424
3389	3,53007,15688	12,81294	3419	3,53389,91008	12,70053
3390	3,53019,96982	12,80916	3420	3,53402,61061	12,69681

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
3421	3,53415,30742	12,69310	3451	3,53794,49593	12,58277
3422	3,53428,00052	12,68939	3452	3,53807,07870	12,57913
3423	3,53440,68991	12,68569	3453	3,53819,65783	12,57549
3424	3,53453,37560	12,68198	3454	3,53832,23332	12,57185
3425	3,53466,05758	12,67828	3455	3,53844,80517	12,56821
3426	3,53478,73586	12,67458	3456	3,53857,37338	12,56457
3427	3,53491,41044	12,67089	3457	3,53869,93795	12,5609[illegible]
3428	3,53504,08133	12,66718	3458	3,53882,49889	12,5573[illegible]
3429	3,53516,74851	12,66349	3459	3,53895,05620	12,5536[illegible]
3430	3,53529,41200	12,65981	3460	3,53907,60988	12,5500[illegible]
3431	3,53542,07181	12,65611	3461	3,53920,15993	12,5464[illegible]
3432	3,53554,72792	12,65242	3462	3,53932,70635	12,5428[illegible]
3433	3,53567,38034	12,64874	3463	3,53945,24915	12,5391[illegible]
3434	3,53580,02908	12,64506	3464	3,53957,78833	12,5355[illegible]
3435	3,53592,67414	12,64138	3465	3,53970,32389	12,5319[illegible]
3436	3,53605,31552	12,63769	3466	3,53982,85584	12,5283[illegible]
3437	3,53617,95321	12,63403	3467	3,53995,38417	12,5247[illegible]
3438	3,53630,58724	12,63034	3468	3,54007,90888	12,5211[illegible]
3439	3,53643,21758	12,62668	3469	3,54020,42998	12,517[illegible]
3440	3,53655,84426	12,62300	3470	3,54032,94748	12,5138[illegible]
3441	3,53668,46726	12,61934	3471	3,54045,46137	12,5102[illegible]
3442	3,53681,08660	12,61567	3472	3,54057,97165	12,5066[illegible]
3443	3,53693,70227	12,61201	3473	3,54070,47833	12,5030[illegible]
3444	3,53706,31428	12,60834	3474	3,54082,98141	12,4994[illegible]
3445	3,53718,92262	12,60469	3475	3,54095,48089	12,4958[illegible]
3446	3,53731,52731	12,60103	3476	3,54107,97678	12,492[illegible]
3447	3,53744,12834	12,59738	3477	3,54120,46907	12,488[illegible]
3448	3,53756,72572	12,59372	3478	3,54132,95777	12,485[illegible]
3449	3,53769,31944	12,59007	3479	3,54145,44287	12,481[illegible]
3450	3,53781,90951	12,58642	3480	3,54157,92439	12,477[illegible]

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
3481	3,54170,40233	12,47435	3511	3,54543,08295	12,36777
3482	3,54182,87668	12,47077	3512	3,54555,45072	12,36426
3483	3,54195,34745	12,46718	3513	3,54567,81498	12,36074
3484	3,54207,81463	12,46361	3514	3,54580,17572	12,35722
3485	3,54220,27824	12,46004	3515	3,54592,53294	12,35370
3486	3,54232,73828	12,45646	3516	3,54604,88664	12,35019
3487	3,54245,19474	12,45289	3517	3,54617,23683	12,34668
3488	3,54257,64763	12,44931	3518	3,54629,58351	12,34317
3489	3,54270,09694	12,44576	3519	3,54641,92668	12,33967
3490	3,54282,54270	12,44218	3520	3,54654,26635	12,33616
3491	3,54294,98488	12,43862	3521	3,54666,60251	12,33265
3492	3,54307,42350	12,43506	3522	3,54678,93516	12,32916
3493	3,54319,85856	12,43150	3523	3,54691,26432	12,32565
3494	3,54332,29006	12,42795	3524	3,54703,58997	12,32216
3495	3,54344,71801	12,42439	3525	3,54715,91213	12,31867
3496	3,54357,14240	12,42083	3526	3,54728,23080	12,31517
3497	3,54369,56323	12,41728	3527	3,54740,54597	12,31168
3498	3,54381,98051	12,41374	3528	3,54752,85765	12,30819
3499	3,54394,39425	12,41019	3529	3,54765,16584	12,30470
3500	3,54406,80444	12,40664	3530	3,54777,47054	12,30122
3501	3,54419,21108	12,40309	3531	3,54789,77176	12,29773
3502	3,54431,61417	12,39956	3532	3,54802,06949	12,29425
3503	3,54444,01373	12,39602	3533	3,54814,36374	12,29078
3504	3,54456,40975	12,39248	3534	3,54826,65452	12,28729
3505	3,54468,80223	12,38895	3535	3,54838,94181	12,28382
3506	3,54481,19118	12,38541	3536	3,54851,22563	12,28035
3507	3,54493,57659	12,38188	3537	3,54863,50598	12,27688
3508	3,54505,95847	12,37835	3538	3,54875,78286	12,27340
3509	3,54518,33682	12,37483	3539	3,54888,05626	12,26994
3510	3,54530,71165	12,37130	3540	3,54900,32620	12,26648

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
3541	3,54912,59268	12,26301	3571	3,55278,98502	12,16000
3542	3,54924,85569	12,25954	3572	3,55291,14502	12,15660
3543	3,54937,11523	12,25609	3573	3,55303,30162	12,15320
3544	3,54949,37132	12,25263	3574	3,55315,45482	12,14979
3545	3,54961,62395	12,24918	3575	3,55327,60461	12,14640
3546	3,54973,87313	12,24572	3576	3,55339,75101	12,14300
3547	3,54986,11885	12,24227	3577	3,55351,89401	12,13961
3548	3,54998,36112	12,23881	3578	3,55364,03362	12,13622
3549	3,55010,59993	12,23538	3579	3,55376,16984	12,13282
3550	3,55022,83531	12,23192	3580	3,55388,30266	12,12944
3551	3,55035,06723	12,22848	3581	3,55400,43210	12,12605
3552	3,55047,29571	12,22504	3582	3,55412,55815	12,12267
3553	3,55059,52075	12,22160	3583	3,55424,68082	12,11928
3554	3,55071,74235	12,21816	3584	3,55436,80010	12,11590
3555	3,55083,96051	12,21472	3585	3,55448,91600	12,11252
3556	3,55096,17523	12,21129	3586	3,55461,02852	12,10915
3557	3,55108,38652	12,20785	3587	3,55473,13767	12,10577
3558	3,55120,59437	12,20443	3588	3,55485,24344	12,10239
3559	3,55132,79880	12,20100	3589	3,55497,34583	12,09903
3560	3,55144,99980	12,19757	3590	3,55509,44486	12,09565
3561	3,55157,19737	12,19414	3591	3,55521,54051	12,09229
3562	3,55169,39151	12,19073	3592	3,55533,63280	12,08892
3563	3,55181,58224	12,18730	3593	3,55545,72172	12,08556
3564	3,55193,76954	12,18388	3594	3,55557,80728	12,08219
3565	3,55205,95342	12,18046	3595	3,55569,88947	12,07884
3566	3,55218,13388	12,17705	3596	3,55581,96831	12,07547
3567	3,55230,31093	12,17364	3597	3,55594,04378	12,07212
3568	3,55242,48457	12,17023	3598	3,55606,11590	12,06877
3569	3,55254,65480	12,16681	3599	3,55618,18467	12,06542
3570	3,55266,82161	12,16341	3600	3,55630,25008	12,06206

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
3601	3,55642,31214	12,05871	3631	3,56002,62489	11,95909
3602	3,55654,37085	12,05536	3632	3,56014,58398	11,95581
3603	3,55666,42621	12,05202	3633	3,56026,53979	11,95251
3604	3,55678,47823	12,04868	3634	3,56038,49230	11,94922
3605	3,55690,52691	12,04533	3635	3,56050,44152	11,94593
3606	3,55702,57224	12,04199	3636	3,56062,38745	11,94266
3607	3,55714,61423	12,03866	3637	3,56074,33011	11,93936
3608	3,55726,65289	12,03532	3638	3,56086,26947	11,93609
3609	3,55738,68821	12,03198	3639	3,56098,20556	11,93280
3610	3,55750,72019	12,02865	3640	3,56110,13836	11,92953
3611	3,55762,74884	12,02532	3641	3,56122,06789	11,92626
3612	3,55774,77416	12,02200	3642	3,56133,99415	11,92297
3613	3,55786,79616	12,01866	3643	3,56145,91712	11,91971
3614	3,55798,81482	12,01534	3644	3,56157,83683	11,91644
3615	3,55810,83016	12,01202	3645	3,56169,75327	11,91316
3616	3,55822,84218	12,00870	3646	3,56181,66643	11,90990
3617	3,55834,85088	12,00537	3647	3,56193,57633	11,90664
3618	3,55846,85625	12,00206	3648	3,56205,48297	11,90337
3619	3,55858,85831	11,99874	3649	3,56217,38634	11,90011
3620	3,55870,85705	11,99543	3650	3,56229,28645	11,89684
3621	3,55882,85248	11,99212	3651	3,56241,18329	11,89360
3622	3,55894,84460	11,98880	3652	3,56253,07689	11,89033
3623	3,55906,83340	11,98550	3653	3,56264,96722	11,88708
3624	3,55918,81890	11,98219	3654	3,56276,85430	11,88383
3625	3,55930,80109	11,97889	3655	3,56288,73813	11,88058
3626	3,55942,77998	11,97558	3656	3,56300,61871	11,87732
3627	3,55954,75556	11,97228	3657	3,56312,49603	11,87408
3628	3,55966,72784	11,96898	3658	3,56324,37011	11,87084
3629	3,55978,69682	11,96568	3659	3,56336,24095	11,86759
3630	3,55990,66250	11,96239	3660	3,56348,10854	11,86435

N.	Logarithmi	Differ.
3661	3,56359,97289	11,86111
3662	3,56371,83400	11,85787
3663	3,56383,69187	11,85463
3664	3,56395,54650	11,85140
3665	3,56407,39790	11,84816
3666	3,56419,24606	11,84494
3667	3,56431,09100	11,84170
3668	3,56442,93270	11,83848
3669	3,56454,77118	11,83525
3670	3,56466,60643	11,83202
3671	3,56478,43845	11,82880
3672	3,56490,26725	11,82558
3673	3,56502,09283	11,82237
3674	3,56513,91520	11,81914
3675	3,56525,73434	11,81593
3676	3,56537,55027	11,81272
3677	3,56549,36299	11,80950
3678	3,56561,17249	11,80629
3679	3,56572,97878	11,80309
3680	3,56584,78187	11,79987
3681	3,56596,58174	11,79668
3682	3,56608,37842	11,79347
3683	3,56620,17189	11,79026
3684	3,56631,96215	11,78707
3685	3,56643,74922	11,78387
3686	3,56655,53309	11,78067
3687	3,56667,31376	11,77748
3688	3,56679,09124	11,77428
3689	3,56690,86552	11,77110
3690	3,56702,63662	11,76790

N.	Logarithmi	Differ.
3691	3,56714,40452	[illegible]
3692	3,56726,16924	[illegible]
3693	3,56737,93077	[illegible]
3694	3,56749,68911	[illegible]
3695	3,56761,44427	[illegible]
3696	3,56773,19625	[illegible]
3697	3,56784,94506	[illegible]
3698	3,56796,69068	[illegible]
3699	3,56808,43313	[illegible]
3700	3,56820,17241	[illegible]
3701	3,56831,90851	[illegible]
3702	3,56843,64144	[illegible]
3703	3,56855,37120	[illegible]
3704	3,56867,09780	[illegible]
3705	3,56878,82123	[illegible]
3706	3,56890,54150	[illegible]
3707	3,56902,25860	[illegible]
3708	3,56913,97255	[illegible]
3709	3,56925,68333	[illegible]
3710	3,56937,39096	[illegible]
3711	3,56949,09543	[illegible]
3712	3,56960,79675	[illegible]
3713	3,56972,49492	[illegible]
3714	3,56984,18994	[illegible]
3715	3,56995,88181	[illegible]
3716	3,57007,57053	[illegible]
3717	3,57019,25611	[illegible]
3718	3,57030,93854	[illegible]
3719	3,57042,61784	[illegible]
3720	3,57054,29399	[illegible]

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
3721	3,57065,96700	11,66988	3751	3,57414,70642	11,57655
3722	3,57077,63688	11,66674	3752	3,57426,28297	11,57347
3723	3,57089,30362	11,66361	3753	3,57437,85644	11,57039
3724	3,57100,96723	11,66048	3754	3,57449,42683	11,56730
3725	3,57112,62771	11,65735	3755	3,57460,99413	11,56423
3726	3,57124,28506	11,65422	3756	3,57472,55836	11,56115
3727	3,57135,93928	11,65109	3757	3,57484,11951	11,55807
3728	3,57147,59037	11,64797	3758	3,57495,67758	11,55499
3729	3,57159,23834	11,64484	3759	3,57507,23257	11,55193
3730	3,57170,88318	11,64172	3760	3,57518,78450	11,54884
3731	3,57182,52490	11,63861	3761	3,57530,33334	11,54578
3732	3,57194,16351	11,63548	3762	3,57541,87912	11,54271
3733	3,57205,79899	11,63237	3763	3,57553,42183	11,53965
3734	3,57217,43136	11,62926	3764	3,57564,96148	11,53657
3735	3,57229,06062	11,62614	3765	3,57576,49805	11,53352
3736	3,57240,68676	11,62302	3766	3,57588,03157	11,53045
3737	3,57252,30978	11,61992	3767	3,57599,56202	11,52739
3738	3,57263,92970	11,61682	3768	3,57611,08941	11,52433
3739	3,57275,54652	11,61370	3769	3,57622,61374	11,52128
3740	3,57287,16022	11,61060	3770	3,57634,13502	11,51822
3741	3,57298,77082	11,60750	3771	3,57645,65324	11,51517
3742	3,57310,37832	11,60439	3772	3,57657,16841	11,51211
3743	3,57321,98271	11,60130	3773	3,57668,68052	11,50906
3744	3,57333,58401	11,59819	3774	3,57680,18958	11,50602
3745	3,57345,18220	11,59510	3775	3,57691,69560	11,50296
3746	3,57356,77730	11,59201	3776	3,57703,19856	11,49992
3747	3,57368,36931	11,58891	3777	3,57714,69848	11,49688
3748	3,57379,95822	11,58582	3778	3,57726,19536	11,49383
3749	3,57391,54404	11,58273	3779	3,57737,68919	11,49079
3750	3,57403,12677	11,57965	3780	3,57749,17998	11,48776

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
3781	3,57760,66774	11,48471	3811	3,58103,89488	11,394[illegible]
3782	3,57772,15245	11,48168	3812	3,58115,28920	11,391[illegible]
3783	3,57783,63413	11,47864	3813	3,58126,68053	11,388[illegible]
3784	3,57795,11277	11,47561	3814	3,58138,06887	11,385[illegible]
3785	3,57806,58838	11,47258	3815	3,58149,45423	11,382[illegible]
3786	3,57818,06096	11,46955	3816	3,58160,83660	11,379[illegible]
3787	3,57829,53051	11,46652	3817	3,58172,21599	11,376[illegible]
3788	3,57840,99703	11,46350	3818	3,58183,59241	11,373[illegible]
3789	3,57852,46053	11,46047	3819	3,58194,96584	11,370[illegible]
3790	3,57863,92100	11,45744	3820	3,58206,33629	11,367[illegible]
3791	3,57875,37844	11,45443	3821	3,58217,70377	11,364[illegible]
3792	3,57886,83287	11,45140	3822	3,58229,06827	11,361[illegible]
3793	3,57898,28427	11,44839	3823	3,58240,42980	11,358[illegible]
3794	3,57909,73266	11,44536	3824	3,58251,78836	11,355[illegible]
3795	3,57921,17802	11,44236	3825	3,58263,14395	11,352[illegible]
3796	3,57932,62038	11,43933	3826	3,58274,49657	11,349[illegible]
3797	3,57944,05971	11,43633	3827	3,58285,84622	11,346[illegible]
3798	3,57955,49604	11,43332	3828	3,58297,19291	11,343[illegible]
3799	3,57966,92936	11,43030	3829	3,58308,53663	11,340[illegible]
3800	3,57978,35966	11,42730	3830	3,58319,87740	11,337[illegible]
3801	3,57989,78696	11,42429	3831	3,58331,21520	11,334[illegible]
3802	3,58001,21125	11,42129	3832	3,58342,55004	11,331[illegible]
3803	3,58012,63254	11,41829	3833	3,58353,88193	11,328[illegible]
3804	3,58024,05083	11,41528	3834	3,58365,21085	11,325[illegible]
3805	3,58035,46611	11,41229	3835	3,58376,53683	11,323[illegible]
3806	3,58046,87840	11,40928	3836	3,58387,85985	11,320[illegible]
3807	3,58058,28768	11,40629	3837	3,58399,17992	11,317[illegible]
3808	3,58069,69397	11,40330	3838	3,58410,49704	11,314[illegible]
3809	3,58081,09727	11,40030	3839	3,58421,81121	11,311[illegible]
3810	3,58092,59757	11,39731	3840	3,58433,12244	11,308[illegible]

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
3841	3,58444,43072	11,30533	3871	3,58782,31713	11,21773
3842	3,58455,73605	11,30240	3872	3,58793,53486	11,21484
3843	3,58467,03845	11,29945	3873	3,58804,74970	11,21194
3844	3,58478,33790	11,29651	3874	3,58815,96164	11,20904
3845	3,58489,63441	11,29358	3875	3,58827,17068	11,20616
3846	3,58500,92799	11,29064	3886	3,58838,37684	11,20326
3847	3,58512,21863	11,28771	3877	3,58849,58010	11,20037
3848	3,58523,50634	11,28477	3878	3,58860,58047	11,19749
3849	3,58534,79111	11,28184	3879	3,58871,97796	11,19460
3850	3,58546,07295	11,27891	3880	3,58883,17256	11,19171
3851	3,58557,35186	11,27599	3881	3,58894,36427	11,18884
3852	3,58568,62785	11,27305	3882	3,58905,55311	11,18594
3853	3,58579,90090	11,27013	3883	3,58916,73905	11,18307
3854	3,58591,17103	11,26721	3884	3,58927,92212	11,18019
3855	3,58602,43824	11,26428	3885	3,58939,10231	11,17732
3856	3,58613,70252	11,26137	3886	3,58950,27963	11,17443
3857	3,58624,96389	11,25844	3887	3,58961,45406	11,17157
3858	3,58636,22233	11,25553	3888	3,58972,62563	11,16868
3859	3,58647,47786	11,25261	3889	3,58983,79431	11,16582
3860	3,58658,73047	11,24969	3890	3,58994,96013	11,16295
3861	3,58669,98016	11,24678	3891	3,59006,12308	11,16008
3862	3,58681,22694	11,24387	3892	3,59017,28316	11,15721
3863	3,58692,47081	11,24096	3893	3,59028,44037	11,15435
3864	3,58703,71177	11,23806	3894	3,59039,59472	11,15148
3865	3,58714,94983	11,23514	3895	3,59050,74620	11,14862
3866	3,58726,18497	11,23224	3896	3,59061,89482	11,14576
3867	3,58737,41721	11,22933	3897	3,59073,04058	11,14290
3868	3,58748,64654	11,22643	3898	3,59084,18348	11,14004
3869	3,58759,87297	11,22353	3899	3,59095,32352	11,13718
3870	3,58771,09650	11,22063	3900	3,59106,46070	11,13433

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
3901	3,59117,59503	11,13148	3931	3,59450,30438	11,04654
3902	3,59128,72651	11,12862	3932	3,59461,35092	11,04372
3903	3,59139,85513	11,12577	3933	3,59472,39464	11,04092
3904	3,59150,98090	11,12292	3934	3,59483,43556	11,03811
3905	3,59162,10382	11,12008	3935	3,59494,47367	11,03531
3906	3,59173,22390	11,11722	3936	3,59505,50898	11,03250
3907	3,59184,34112	11,11438	3937	3,59516,54148	11,02970
3908	3,59195,45550	11,11154	3938	3,59527,57118	11,02690
3909	3,59206,56704	11,10870	3939	3,59538,59808	11,02410
3910	3,59217,67574	11,10586	3940	3,59549,62218	11,02131
3911	3,59228,78160	11,10301	3941	3,59560,64349	11,01850
3912	3,59239,88461	11,10018	3942	3,59571,66199	11,01572
3913	3,59250,98479	11,09734	3943	3,59582,67771	11,01292
3914	3,59262,08213	11,09451	3944	3,59593,69063	11,01012
3915	3,59273,17664	11,09167	3945	3,59604,70075	11,00734
3916	3,59284,26831	11,08884	3946	3,59615,70809	11,00455
3917	3,59295,35715	11,08602	3947	3,59626,71264	11,00176
3918	3,59306,44317	11,08318	3948	3,59637,71440	10,99897
3919	3,59317,52635	11,08035	3949	3,59648,71337	10,99619
3920	3,59328,60670	11,07753	3950	3,59659,70956	10,99341
3921	3,59339,68423	11,07470	3951	3,59670,70297	10,99062
3922	3,59350,75893	11,07188	3952	3,59681,69359	10,98784
3923	3,59361,83081	11,06906	3953	3,59692,68143	10,98507
3924	3,59372,89987	11,06624	3954	3,59703,66650	10,98228
3925	3,59383,96611	11,06342	3955	3,59714,64878	10,97951
3926	3,59395,02953	11,06060	3956	3,59725,62829	10,97674
3927	3,59406,09013	11,05778	3957	3,59736,60503	10,97396
3928	3,59417,14791	11,05497	3958	3,59747,57899	10,97119
3929	3,59428,20288	11,05216	3959	3,59758,55018	10,96841
3930	3,59439,25504	11,04934	3960	3,59769,51859	10,96565

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
3961	3,59780,48424	10,96288	3991	3,60108,17278	10,88048
3962	3,59791,44712	10,96011	3992	3,60119,05326	10,87776
3963	3,59802,40723	10,95735	3993	3,60129,93102	10,87503
3964	3,59813,36458	10,95459	3994	3,60140,80605	10,87232
3965	3,59824,31917	10,95182	3995	3,60151,67837	10,86959
3966	3,59835,27099	10,94906	3996	3,60162,54796	10,86687
3967	3,59846,22005	10,94630	3997	3,60173,41483	10,86415
3968	3,59857,16635	10,94354	3998	3,60184,27898	10,86143
3969	3,59868,10989	10,94079	3999	3,60195,14041	10,85872
3970	3,59879,05068	10,93803	4000	3,60205,99913	10,85601
3971	3,59889,98871	10,93527	4001	3,60216,85514	10,85329
3972	3,59900,92398	10,93253	4002	3,60227,70843	10,85058
3973	3,59911,85651	10,92977	4003	3,60238,55901	10,84787
3974	3,59922,78628	10,92702	4004	3,60249,40688	10,84516
3975	3,59933,71330	10,92427	4005	3,60260,25204	10,84246
3976	3,59944,63757	10,92153	4006	3,60271,09450	10,83974
3977	3,59955,55910	10,91878	4007	3,60281,93424	10,83705
3978	3,59966,47788	10,91603	4008	3,60292,77129	10,83434
3979	3,59977,39391	10,91330	4009	3,60303,60563	10,83163
3980	3,59988,30721	10,91055	4010	3,60314,43726	10,82894
3981	3,59999,21776	10,90781	4011	3,60325,26620	10,82623
3982	3,60010,12557	10,90507	4012	3,60336,09243	10,82354
3983	3,60021,03064	10,90234	4013	3,60346,91597	10,82085
3984	3,60031,93298	10,89959	4014	3,60357,73682	10,81814
3985	3,60042,83257	10,89687	4015	3,60368,55496	10,81545
3986	3,60053,72944	10,89413	4016	3,60379,37041	10,81276
3987	3,60064,62357	10,89139	4017	3,60390,18317	10,81007
3988	3,60075,51496	10,88867	4018	3,60400,99324	10,80738
3989	3,60086,40363	10,88594	4019	3,60411,80062	10,80469
3990	3,60097,28957	10,88321	4020	3,60422,60531	10,80200

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
4021	3,60433,40731	10,79932	4051	3,60756,22432	10,7193[illegible]
4022	3,60444,20663	10,79663	4052	3,60766,94367	10,7167[illegible]
4023	3,60455,00326	10,79394	4053	3,60777,66037	10,7140[illegible]
4024	3,60465,79720	10,79127	4054	3,60788,37444	10,7114[illegible]
4025	3,60476,58847	10,78859	4055	3,60799,08585	10,7087[illegible]
4026	3,60487,37706	10,78590	4056	3,60809,79463	10,7061[illegible]
4027	3,60498,16296	10,78323	4057	3,60820,50077	10,7035[illegible]
4028	3,60508,94619	10,78055	4058	3,60831,20427	10,7008[illegible]
4029	3,60519,72674	10,77787	4059	3,60841,90513	10,6982[illegible]
4030	3,60530,50461	10,77521	4060	3,60852,60336	10,6955[illegible]
4031	3,60541,27982	10,77252	4061	3,60863,29895	10,6929[illegible]
4032	3,60552,05234	10,76986	4062	3,60873,99191	10,6903[illegible]
4033	3,60562,82220	10,76719	4063	3,60884,68223	10,6877[illegible]
4034	3,60573,58939	10,76452	4064	3,60895,36993	10,6850[illegible]
4035	3,60584,35391	10,76185	4065	3,60906,05499	10,6824[illegible]
4036	3,60595,11576	10,75918	4066	3,60916,73743	10,6798[illegible]
4037	3,60605,87494	10,75652	4067	3,60927,41724	10,6771[illegible]
4038	3,60616,63146	10,75386	4068	3,60938,09443	10,6745[illegible]
4039	3,60627,38532	10,75119	4069	3,60948,76899	10,6719[illegible]
4040	3,60638,13651	10,74853	4070	3,60959,44092	10,6693[illegible]
4041	3,60648,88504	10,74588	4071	3,60970,11024	10,6666[illegible]
4042	3,60659,63092	10,74321	4072	3,60980,77693	10,6640[illegible]
4043	3,60670,37413	10,74056	4073	3,60991,44101	10,6614[illegible]
4044	3,60681,11469	10,73790	4074	3,61002,10247	10,6588[illegible]
4045	3,60691,85259	10,73525	4075	3,61012,76131	10,6562[illegible]
4046	3,60702,58784	10,73260	4076	3,61023,41753	10,6536[illegible]
4047	3,60713,32044	10,72994	4077	3,61034,07115	10,6509[illegible]
4048	3,60724,05038	10,72730	4078	3,61044,72214	10,6483[illegible]
4049	3,60734,77768	10,72464	4079	3,61055,37053	10,6457[illegible]
4050	3,60745,50232	10,72200	4080	3,61066,01631	10,6431[illegible]

N.	Logarithmi	Differ.
4081	3,61076,65948	10,64056
4082	3,61087,30004	10,63795
4083	3,61097,93799	10,63535
4084	3,61108,57334	10,63275
4085	3,61119,20609	10,63014
4086	3,61129,83623	10,62754
4087	3,61140,46377	10,62494
4088	3,61151,08871	10,62235
4089	3,61161,71106	10,61974
4090	3,61172,33080	10,61715
4091	3,61182,94795	10,61455
4092	3,61193,56250	10,61196
4093	3,61204,17446	10,60937
4094	3,61214,78383	10,60678
4095	3,61225,39061	10,60419
4096	3,61235,99480	10,60160
4097	3,61246,59640	10,59901
4098	3,61257,19541	10,59642
4099	3,61267,79183	10,59384
4100	3,61278,38567	10,59126
4101	3,61288,97693	10,58867
4102	3,61299,56560	10,58610
4103	3,61310,15170	10,58351
4104	3,61320,73521	10,58094
4105	3,61331,31615	10,57835
4106	3,61341,89450	10,57579
4107	3,61352,47029	10,57320
4108	3,61363,04349	10,57064
4109	3,61373,61413	10,56806
4110	3,61384,18219	10,56549
4111	3,61394,74768	10,56292
4112	3,61405,31060	10,56035
4113	3,61415,87095	10,55779
4114	3,61426,42874	10,55521
4115	3,61436,98395	10,55266
4116	3,61447,53661	10,55009
4117	3,61458,08670	10,54753
4118	3,61468,63423	10,54497
4119	3,61479,17920	10,54240
4120	3,61489,72160	10,53985
4121	3,61500,26145	10,53729
4122	3,61510,79874	10,53474
4123	3,61521,33348	10,53218
4124	3,61531,86566	10,52963
4125	3,61542,39529	10,52707
4126	3,61552,92236	10,52453
4127	3,61563,44689	10,52197
4128	3,61573,96886	10,51943
4129	3,61584,48829	10,51688
4130	3,61595,00517	10,51433
4131	3,61605,51950	10,51178
4132	3,61616,03128	10,50925
4133	3,61626,54053	10,50670
4134	3,61637,04723	10,50416
4135	3,61647,55139	10,50162
4136	3,61658,05301	10,49908
4137	3,61668,55209	10,49654
4138	3,61679,04863	10,49401
4139	3,61689,54264	10,49147
4140	3,61700,03411	10,48894

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
4141	3,61710,52305	10,48641	4171	3,62024,01898	10,41100
4142	3,61721,00946	10,48387	4172	3,62034,42998	10,40849
4143	3,61731,49333	10,48134	4173	3,62044,83847	10,40600
4144	3,61741,97467	10,47882	4174	3,62055,24447	10,40351
4145	3,61752,45349	10,47629	4175	3,62065,64798	10,40102
4146	3,61762,92978	10,47376	4176	3,62076,04900	10,39853
4147	3,61773,40354	10,47123	4177	3,62086,44753	10,39603
4148	3,61783,87477	10,46871	4178	3,62096,84356	10,39355
4149	3,61794,34348	10,46619	4179	3,62107,23711	10,39107
4150	3,61804,80967	10,46367	4180	3,62117,62818	10,38858
4151	3,61815,27334	10,46114	4181	3,62128,01676	10,38609
4152	3,61825,73448	10,45863	4182	3,62138,40285	10,38361
4153	3,61836,19311	10,45611	4183	3,62148,78646	10,38113
4154	3,61846,64922	10,45359	4184	3,62159,16759	10,37864
4155	3,61857,10281	10,45108	4185	3,62169,54623	10,37617
4156	3,61867,55389	10,44856	4186	3,62179,92240	10,37369
4157	3,61878,00245	10,44605	4187	3,62190,29609	10,37121
4158	3,61888,44850	10,44354	4188	3,62200,66730	10,36874
4159	3,61898,89204	10,44102	4189	3,62211,03604	10,36626
4160	3,61909,33306	10,43852	4190	3,62221,40230	10,36378
4161	3,61919,77158	10,43601	4191	3,62231,76608	10,36132
4162	3,61930,20759	10,43350	4192	3,62242,12740	10,35884
4163	3,61940,64109	10,43099	4193	3,62252,48624	10,35637
4164	3,61951,07208	10,42849	4194	3,62262,84261	10,35391
4165	3,61961,50057	10,42599	4195	3,62273,19652	10,35143
4166	3,61971,92656	10,42349	4196	3,62283,54795	10,34897
4167	3,61982,35005	10,42098	4197	3,62293,89692	10,34650
4168	3,61992,77103	10,41848	4198	3,62304,24342	10,34404
4169	3,62003,18951	10,41599	4199	3,62314,58746	10,34158
4170	3,62013,60550	10,41348	4200	3,62324,92904	10,33911

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
4201	3,62335,26815	10,33666	4231	3,62644,30253	10,26337
4202	3,62345,60481	10,33419	4232	3,62654,56590	10,26095
4203	3,62355,93900	10,33174	4233	3,62664,82685	10,25852
4204	3,62366,27074	10,32927	4234	3,62675,08537	10,25610
4205	3,62376,60001	10,32683	4235	3,62685,34147	10,25367
4206	3,62386,92684	10,32436	4236	3,62695,59514	10,25126
4207	3,62397,25120	10,32191	4237	3,62705,84640	10,24884
4208	3,62407,57311	10,31946	4238	3,62716,09524	10,24642
4209	3,62417,89257	10,31701	4239	3,62726,34166	10,24400
4210	3,62428,20958	10,31456	4240	3,62736,58566	10,24159
4211	3,62438,52414	10,31211	4241	3,62746,82725	10,23917
4212	3,62448,83625	10,30966	4242	3,62757,06642	10,23676
4213	3,62459,14591	10,30722	4243	3,62767,30318	10,23434
4214	3,62469,45313	10,30477	4244	3,62777,53752	10,23194
4215	3,62479,75790	10,30232	4245	3,62787,76946	10,22952
4216	3,62490,06022	10,29988	4246	3,62797,99898	10,22712
4217	3,62500,36010	10,29744	4247	3,62808,22610	10,22471
4218	3,62510,65754	10,29500	4248	3,62818,45081	10,22230
4219	3,62520,95254	10,29256	4249	3,62828,67311	10,21990
4220	3,62531,24510	10,29012	4250	3,62838,89301	10,21749
4221	3,62541,53522	10,28768	4251	3,62849,11050	10,21509
4222	3,62551,82290	10,28524	4252	3,62859,32559	10,21268
4223	3,62562,10814	10,28281	4253	3,62869,53827	10,21029
4224	3,62572,39095	10,28038	4254	3,62879,74856	10,20788
4225	3,62582,67133	10,27794	4255	3,62889,95644	10,20549
4226	3,62592,94927	10,27551	4256	3,62900,16193	10,20309
4227	3,62603,22478	10,27308	4257	3,62910,36502	10,20069
4228	3,62613,49786	10,27065	4258	3,62920,56571	10,19830
4229	3,62623,76851	10,26823	4259	3,62930,76401	10,19590
4230	3,62634,03674	10,26579	4260	3,62940,95991	10,19351

N.	Logarithmi	Differ.
4261	3,62951,15342	10,19112
4262	3,62961,34454	10,18872
4263	3,62971,53326	10,18634
4264	3,62981,71960	10,18395
4265	3,62991,90355	10,18156
4266	3,63002,08511	10,17918
4267	3,63012,26429	10,17679
4268	3,63022,44108	10,17440
4269	3,63032,61548	10,17202
4270	3,63042,78750	10,16964
4271	3,63052,95714	10,16726
4272	3,63063,12440	10,16488
4273	3,63073,28928	10,16250
4274	3,63083,45178	10,16013
4275	3,63093,61191	10,15774
4276	3,63103,76965	10,15538
4277	3,63113,92503	10,15299
4278	3,63124,07802	10,15063
4279	3,63134,22865	10,24825
4280	3,63144,37690	10,14588
4281	3,63154,52278	10,14352
4282	3,63164,66630	10,14114
4283	3,63174,80744	10,13878
4284	3,63184,94622	10,13641
4285	3,63195,08263	10,13404
4286	3,63205,21667	10,13168
4287	3,63215,34835	10,12932
4288	3,63225,47767	10,12695
4289	3,63235,60462	10,12460
4290	3,63245,72922	10,1[illegible]2[illegible]3

N.	Logarithmi	Differ.
4291	3,63255,85145	10,11988
4292	3,63265,97133	10,11752
4293	3,63276,08885	10,11516
4294	3,63286,20401	10,11281
4295	3,63296,31682	10,11045
4296	3,63306,42727	10,10810
4297	3,63316,53537	10,10575
4298	3,63326,64112	10,10339
4299	3,63336,74451	10,10105
4300	3,63346,84556	10,09870
4301	3,63356,94426	10,09635
4302	3,63367,04061	10,09400
4303	3,63377,13461	10,09166
4304	3,63387,22627	10,08931
4305	3,63397,31558	10,08697
4306	3,63407,40255	10,08463
4307	3,63417,48718	10,08228
4308	3,63427,56946	10,07995
4309	3,63437,64941	10,07761
4310	3,63447,72702	10,07527
4311	3,63457,80229	10,07293
4312	3,63467,87522	10,07059
4313	3,63477,94581	10,06827
4314	3,63488,01408	10,06593
4315	3,63498,08001	10,06359
4316	3,63508,14360	10,06127
4317	3,63518,20487	10,05893
4318	3,63528,26380	10,05660
4319	3,63538,32040	10,05428
4320	3,63548,37468	10,05197

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
4321	3,63558,42663	10,04962	4351	3,63858,90833	9,98034
4322	3,63568,47625	10,04730	4352	3,63868,88867	9,97805
4323	3,63578,52355	10,04498	4353	3,63878,86672	9,97575
4324	3,63588,56853	10,04265	4354	3,63888,84247	9,97346
4325	3,63598,61118	10,04033	4355	3,63898,81593	9,97118
4326	3,63608,65151	10,03801	4356	3,63908,78711	9,96888
4327	3,63618,68952	10,03569	4357	3,63918,75599	9,96660
4328	3,63628,72521	10,03337	4358	3,63928,72259	9,96431
4329	3,63638,75858	10,03106	4359	3,63938,68690	9,96203
4330	3,63648,78964	10,02873	4360	3,63948,64893	9,95974
4331	3,63658,81837	10,02643	4361	3,63958,60867	9,95745
4332	3,63668,84480	10,02410	4362	3,63968,56612	9,95518
4333	3,63678,86890	10,02180	4363	3,63978,52130	9,95289
4334	3,63688,89070	10,01948	4364	3,63988,47419	9,95061
4335	3,63698,91018	10,01717	4365	3,63998,42480	9,94834
4336	3,63708,92735	10,01486	4366	3,64008,37314	9,94605
4337	3,63718,94221	10,01256	4367	3,64018,31919	9,94378
4338	3,63728,95477	10,01024	4368	3,64028,26297	9,94150
4339	3,63738,96501	10,00794	4369	3,64038,20447	9,93923
4340	3,63748,97295	10,00563	4370	3,64048,14370	9,93695
4341	3,63758,97858	10,00333	4371	3,64058,08065	9,93468
4342	3,63768,98191	10,00103	4372	3,64086,01533	9,93240
4343	3,63778,98294	9,99872	4373	3,64077,94773	9,93014
4344	3,63788,98166	9,99642	4374	3,64087,87787	9,92787
4345	3,63798,97808	9,99412	4375	3,64097,80574	9,92559
4346	3,63808,97220	9,99182	4376	3,64107,73133	9,92333
4347	3,63818,96402	9,98952	4377	3,64117,65466	9,92106
4348	3,63828,95354	9,98723	4378	3,64127,57572	9,91880
4349	3,63838,94077	9,98493	4379	3,64137,49452	9,91653
4350	3,63848,92570	9,98263	4380	3,64147,41105	9,91427

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
4381	3,64157,32532	9,91200	4411	3,64453,70578	9,84460
4382	3,64167,23732	9,90975	4412	3,64463,55038	9,84236
4383	3,64177,14707	9,90748	4413	3,64473,39274	9,84014
4384	3,64187,05455	9,90522	4414	3,64483,23288	9,83791
4385	3,64196,95977	9,90296	4415	3,64493,07079	9,83568
4386	3,64206,86273	9,90071	4416	3,64502,90647	9,83346
4387	3,64216,76344	9,89845	4417	3,64512,73993	9,83122
4388	3,64226,66189	9,89619	4418	3,64522,57115	9,82901
4389	3,64236,55808	9,89394	4419	3,64532,40016	9,82677
4390	3,64246,45202	9,89169	4420	3,64542,22693	9,82456
4391	3,64256,34371	9,88943	4421	3,64552,05149	9,82233
4392	3,64266,23314	9,88719	4422	3,64561,87382	9,82012
4393	3,64276,12033	9,88493	4423	3,64571,69394	9,81789
4394	3,64286,00526	9,88268	4424	3,64581,51183	9,81567
4395	3,64295,88794	9,88044	4425	3,64591,32750	9,81346
4396	3,64305,76838	9,87818	4426	3,64601,14096	9,81124
4397	3,64315,64656	9,87594	4427	3,64610,95220	9,80902
4398	3,64325,52250	9,87370	4428	3,64620,76122	9,80681
4399	3,64335,39620	9,87145	4429	3,64630,56803	9,80459
4400	3,64345,26765	9,86921	4430	3,64640,37262	9,80238
4401	3,64355,13686	9,86696	4431	3,64650,17500	9,80017
4402	3,64365,00382	9,86473	4432	3,64659,97517	9,79796
4403	3,64374,86855	9,86248	4433	3,64669,77313	9,79575
4404	3,64384,73103	9,86024	4434	3,64679,56888	9,79354
4405	3,64394,59127	9,85801	4435	3,64689,36242	9,79133
4406	3,64404,44928	9,85577	4436	3,64699,15375	9,78912
4407	3,64414,30505	9,85353	4437	3,64708,94287	9,78692
4408	3,64424,15858	9,85130	4438	3,64718,72979	9,78471
4409	3,64434,00988	9,84907	4439	3,64728,51450	9,78251
4410	3,64443,85895	9,84683	4440	3,64738,29701	9,78031

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
4441	3,64748,07732	9,77810	4471	3,65040,46699	9,71250
4442	3,64757,85542	9,77590	4472	3,65050,17949	9,71033
4443	3,64767,63132	9,77371	4473	3,65059,88982	9,70816
4444	3,64777,40503	9,77150	4474	3,65069,59798	9,70599
4445	3,64787,17653	9,76931	4475	3,65079,30397	9,70382
4446	3,64796,94584	9,76710	4476	3,65089,00779	9,70165
4447	3,64806,71294	9,76492	4477	3,65098,70944	9,69948
4448	3,64816,47786	9,76271	4478	3,65108,40892	9,69732
4449	3,64826,24057	9,76053	4479	3,65118,10624	9,69516
4450	3,64836,00110	9,75833	4480	3,65127,80140	9,69299
4451	3,64845,75943	9,75614	4481	3,65137,49439	9,69083
4452	3,64855,51557	9,75394	4482	3,65147,18522	9,68867
4453	3,64865,26951	9,75176	4483	3,65156,87389	9,68650
4454	3,64875,02127	9,74957	4484	3,65166,56039	9,68435
4455	3,64884,77084	9,74738	4485	3,65176,24474	9,68218
4456	3,64894,51822	9,74519	4486	3,65185,92692	9,68003
4457	3,64904,26341	9,74300	4487	3,65195,60695	9,67787
4458	3,64914,00641	9,74082	4488	3,65205,28482	9,67572
4459	3,64923,74723	9,73864	4489	3,65214,96054	9,67356
4460	3,64933,48587	9,73645	4490	3,65224,63410	9,67141
4461	3,64943,22232	9,73428	4491	3,65234,30551	9,66925
4462	3,64952,95660	9,73208	4492	3,65243,97476	9,66710
4463	3,64962,68868	9,72991	4493	3,65253,64186	9,66495
4464	3,64972,41859	9,72773	4494	3,65263,30681	9,66280
4465	3,64982,14632	9,72555	4495	3,65272,96961	9,66065
4466	3,64991,87187	9,72338	4496	3,65282,63026	9,65850
4467	3,65001,59525	9,72119	4497	3,65292,28876	9,65635
4468	3,65011,31644	9,71903	4498	3,65301,94511	9,65421
4469	3,65021,03547	9,71684	4499	3,65311,59932	9,65206
4470	3,65030,75231	9,71468	4500	3,65321,25138	9,64991

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
4501	3,65330,90129	9,64778	4531	3,65619,40622	9,58390
4502	3,65340,54907	9,64563	4532	3,65628,99012	9,58179
4503	3,65350,19470	9,64348	4533	3,65638,57191	9,57967
4504	3,65359,83818	9,64135	4534	3,65648,15158	9,57756
4505	3,65369,47953	9,63921	4535	3,65657,72914	9,57545
4506	3,65379,11874	9,63707	4536	3,65667,30459	9,57334
4507	3,65388,75581	9,63493	4537	3,65676,87793	9,57122
4508	3,65398,39074	9,63279	4538	3,65686,44915	9,56912
4509	3,65408,02353	9,63066	4539	3,65696,01827	9,56702
4510	3,65417,65419	9,62852	4540	3,65705,58529	9,56490
4511	3,65427,28271	9,62639	4541	3,65715,15019	9,56280
4512	3,65436,90910	9,62425	4542	3,65724,71299	9,56069
4513	3,65446,53335	9,62212	4543	3,65734,27368	9,55859
4514	3,65456,15547	9,61999	4544	3,65743,83227	9,55649
4515	3,65465,77546	9,61787	4545	3,65753,38876	9,55438
4516	3,65475,39333	9,61573	4546	3,65762,94314	9,55228
4517	3,65485,00906	9,61360	4547	3,65772,49542	9,55018
4518	3,65494,62266	9,61147	4548	3,65782,04560	9,54808
4519	3,65504,23413	9,60935	4549	3,65791,59368	9,54599
4520	3,65513,84348	9,60722	4550	3,65801,13967	9,54388
4521	3,65523,45070	9,60510	4551	3,65810,68355	9,54179
4522	3,65533,05580	9,60297	4552	3,65820,22534	9,53969
4523	3,65542,65877	9,60086	4553	3,65829,73503	9,53760
4524	3,65552,25963	9,59872	4554	3,65839,30263	9,53550
4525	3,65561,85835	9,59661	4555	3,65848,83813	9,53341
4526	3,65571,45496	9,59449	4556	3,65858,37154	9,53132
4527	3,65581,04945	9,59237	4557	3,65867,90286	9,52922
4528	3,65590,64182	9,59025	4558	3,65877,43208	9,52714
4529	3,65600,23207	9,58813	4559	3,65886,95922	9,52505
4530	3,65609,82020	9,58602	4560	3,65896,48427	9,52295

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
4561	3,65906,00722	9,52087	4591	3,66190,72928	9,45866
4562	3,65915,52809	9,51879	4592	3,66200,18794	9,45660
4563	3,65925,04688	9,51669	4593	3,66209,64454	9,45455
4564	3,65934,56357	9,51462	4594	3,66219,09909	9,45248
4565	3,65944,07819	9,51253	4595	3,66228,55157	9,45043
4566	3,65953,59072	9,51044	4596	3,66238,00200	9,44838
4567	3,65963,10116	9,50836	4597	3,66247,45038	9,44631
4568	3,65972,60952	9,50629	4598	3,66256,89669	9,44427
4569	3,65982,11581	9,50420	4599	3,66266,34096	9,44221
4570	3,65991,62001	9,50212	4600	3,66275,78317	9,44016
4571	3,66001,12213	9,50004	4601	3,66285,22333	9,43810
4572	3,66010,62217	9,49797	4602	3,66294,66143	9,43606
4573	3,66020,12014	9,49589	4603	3,66304,09749	9,43401
4574	3,66029,61603	9,49381	4604	3,66313,53150	9,43195
4575	3,66039,10984	9,49174	4605	3,66322,96345	9,42991
4576	3,66048,60158	9,48966	4606	3,66332,39336	9,42787
4577	3,66058,09124	9,48759	4607	3,66341,82123	9,42581
4578	3,66067,57883	9,48552	4608	3,66351,24704	9,42377
4579	3,66077,06435	9,48345	4609	3,66360,67081	9,42173
4580	3,66086,54780	9,48138	4610	3,66370,09254	9,41968
4581	3,66096,02918	9,47931	4611	3,66379,51222	9,41764
4582	3,66105,50849	9,47723	4612	3,66388,92986	9,41560
4583	3,66114,98572	9,47518	4613	3,66398,34546	9,41356
4584	3,66124,46090	9,47310	4614	3,66407,75902	9,41152
4585	3,66133,93400	9,47104	4615	3,66417,17054	9,40947
4586	3,66143,40504	9,46897	4616	3,66426,58001	9,40745
4587	3,66152,87401	9,46691	4617	3,66435,98746	9,40540
4588	3,66162,34092	9,46485	4618	3,66445,39286	9,40336
4589	3,66171,80577	9,46278	4619	3,66454,79622	9,40134
4590	3,66181,26855	9,46073	4620	3,66464,19756	9,39929

N.	Logarithmi	Differ.
4621	3,66473,59685	9,39726
4622	3,66482,99411	9,39523
4623	3,66492,38934	9,39320
4624	3,66501,78254	9,39117
4625	3,66511,17371	9,38913
4626	3,66520,56284	9,38711
4627	3,66529,94995	9,38508
4628	3,66539,33503	9,38305
4629	3,66548,71808	9,38102
4630	3,66558,09910	9,37900
4631	3,66567,47810	9,37697
4632	3,66576,85507	9,37495
4633	3,66586,23002	9,37293
4634	3,66595,60295	9,37090
4635	3,66604,97385	9,36888
4636	3,66614,34273	9,36686
4637	3,66623,70959	9,36484
4638	3,66633,07443	9,36282
4639	3,66642,43725	9,36081
4640	3,66651,79806	9,35878
4641	3,66661,15684	9,35677
4642	3,66670,51361	9,35476
4643	3,66679,86837	9,35274
4644	3,66689,22111	9,35072
4645	3,66698,57183	9,34872
4646	3,66707,92055	9,34670
4647	3,66717,26725	9,34469
4648	3,66726,61194	9,34268
4649	3,66735,95462	9,34067
4650	3,66745,29529	9,33866

N.	Logarithmi	Differ.
4651	3,66754,63395	9,33666
4652	3,66763,97061	9,33464
4653	3,66773,30525	9,33265
4654	3,66782,63790	9,33063
4655	3,66791,96853	9,32863
4656	3,66801,29716	9,32663
4657	3,66810,62379	9,32463
4658	3,66819,94842	9,32262
4659	3,66829,27104	9,32063
4660	3,66838,59167	9,31862
4661	3,66847,91029	9,31663
4662	3,66857,22692	9,31463
4663	3,66866,54155	9,31263
4664	3,66875,85418	9,31063
4665	3,66885,16481	9,30864
4666	3,66894,47345	9,30664
4667	3,66903,78009	9,30465
4668	3,66913,08474	9,30265
4669	3,66922,38739	9,30067
4670	3,66931,68806	9,29867
4671	3,66940,98673	9,29668
4672	3,66950,28341	9,29469
4673	3,66959,57810	9,29271
4674	3,66968,87081	9,29071
4675	3,66978,16152	9,28873
4676	3,66987,45025	9,28674
4677	3,66996,73699	9,28476
4678	3,67006,02175	9,28277
4679	3,67015,30452	9,28079
4680	3,67024,58531	9,27880

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
4681	3,67033,86411	9,27683	4711	3,67311,31042	9,21776
4682	3,67043,14094	9,27484	4712	3,67320,52818	9,21580
4683	3,67052,41578	9,27286	4713	3,67329,74398	9,21384
4684	3,67061,68864	9,27088	4714	3,67338,95782	9,21189
4685	3,67070,95952	9,26891	4715	3,67348,16971	9,20993
4686	3,67080,22843	9,26692	4716	3,67357,37964	9,20798
4687	3,67089,49535	9,26495	4717	3,67366,58762	9,20603
4688	3,67098,76030	9,26297	4718	3,67375,79365	9,20408
4689	3,67108,02327	9,26100	4719	3,67384,99773	9,20213
4690	3,67117,28427	9,25902	4720	3,67394,19986	9,20018
4691	3,67126,54329	9,25705	4721	3,67403,40004	9,19823
4692	3,67135,80034	9,25508	4722	3,67412,59827	9,19629
4693	3,67145,05542	9,25311	4723	3,67421,79456	9,19433
4694	3,67154,30853	9,25113	4724	3,67430,98889	9,19239
4695	3,67163,55966	9,24916	4725	3,67440,18128	9,19045
4696	3,67172,80882	9,24720	4726	3,67449,37173	9,18850
4697	3,67182,05602	9,24522	4727	3,67458,56023	9,18656
4698	3,67191,30124	9,24326	4728	3,67467,74679	9,18461
4699	3,67200,54450	9,24129	4729	3,67476,93140	9,18267
4700	3,67209,78579	9,23933	4730	3,67486,11407	9,18073
4701	3,67219,02512	9,23736	4731	3,67495,29480	9,17880
4702	3,67228,26248	9,23539	4732	3,67504,47360	9,17685
4703	3,67237,49787	9,23344	4733	3,67513,65045	9,17491
4704	3,67246,73131	9,23147	4734	3,67522,82536	9,17297
4705	3,67255,96278	9,22950	4735	3,67531,99833	9,17104
4706	3,67265,19228	9,22755	4736	3,67541,16937	9,16910
4707	3,67274,41983	9,22559	4737	3,67550,33847	9,16717
4708	3,67283,64542	9,22362	4738	3,67559,50564	9,16523
4709	3,67292,86904	9,22167	4739	3,67568,67087	9,16330
4710	3,67302,09071	9,21971	4740	3,67577,83417	9,161[illegible]

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
4741	3,67586,99553	9,15943	4771	3,67860,94166	9,10184
4742	3,67596,15496	9,15751	4772	3,67870,04350	9,09994
4743	3,67605,31247	9,15557	4773	3,67879,14344	9,09803
4744	3,67614,46804	9,15364	4774	3,67888,24147	9,09612
4745	3,67623,62168	9,15171	4775	3,67897,33759	9,09422
4746	3,67632,77339	9,14978	4776	3,67906,43181	9,09232
4747	3,67641,92317	9,14786	4777	3,67915,52413	9,09041
4748	3,67651,07103	9,14593	4778	3,67924,61454	9,08851
4749	3,67660,21696	9,14400	4779	3,67933,70305	9,08661
4750	3,67669,36096	9,14208	4780	3,67942,78966	9,08471
4751	3,67678,50304	9,14016	4781	3,67951,87437	9,08281
4752	3,67687,64320	9,13823	4782	3,67960,95718	9,08091
4753	3,67696,78143	9,13631	4783	3,67970,03809	9,07901
4754	3,67705,91774	9,13439	4784	3,67979,11710	9,07711
4755	3,67715,05213	9,13246	4785	3,67988,19421	9,07522
4756	3,67724,18459	9,13055	4786	3,67997,26943	9,07332
4757	3,67733,31514	9,13863	4787	3,68006,34275	9,07142
4758	3,67742,44377	9,12671	4788	3,68015,41417	9,06953
4759	3,67751,57048	9,12479	4789	3,68024,48370	9,06764
4760	3,67760,69527	9,12288	4790	3,68033,55134	9,06575
4761	3,67769,81815	9,12096	4791	3,68042,61709	9,06385
4762	3,67778,93911	9,11904	4792	3,68051,68094	9,06196
4763	3,67788,05815	9,11713	4793	3,68060,74290	9,06007
4764	3,67797,17528	9,11522	4794	3,68069,80297	9,05818
4765	3,67806,29050	9,11330	4795	3,68078,86115	9,05629
4766	3,67815,40380	9,11139	4796	3,68087,91744	9,05441
4767	3,67824,51519	9,10948	4797	3,68096,97185	9,05252
4768	3,67833,62467	9,10757	4798	3,68106,02436	9,05063
4769	3,67842,73224	9,10566	4799	3,68115,07499	9,04875
4770	3,67851,83790	9,10376	4800	3,68124,12374	9,04686

N.	Logarithmi	Differ.
4801	3,68133,17060	9,94497
4802	3,68142,21557	9,04309
4803	3,68151,25866	9,04121
4804	3,68160,29987	9,03933
4805	3,68169,33920	9,03745
4806	3,68178,37665	9,03556
4807	3,68187,41221	9,03369
4808	3,68196,44590	9,03181
4809	3,68205,47771	9,02993
4810	3,68214,50764	9,02805
4811	3,68223,53569	9,02618
4812	3,68232,56187	9,02430
4813	3,68241,58617	9,02242
4814	3,68250,60859	9,02056
4815	3,68259,62915	9,01867
4816	3,68268,64782	9,01681
4817	3,68277,66463	9,01494
4818	3,68286,67957	9,01306
4819	3,68295,69263	9,01119
4820	3,68304,70382	9,00933
4821	3,68313,71315	9,00745
4822	3,68322,72060	9,00559
4823	3,68331,72619	9,00372
4824	3,68340,72991	9,00186
4825	3,68349,73177	8,99999
4826	3,68358,73176	8,99812
4827	3,68367,72988	8,99626
4828	3,68376,72614	8,99440
4829	3,68385,72054	8,99254
4830	3,68394,71308	8,99067

N.	Logarithmi	Differ.
4831	3,68403,70375	8,98881
4832	3,68412,69256	8,98695
4833	3,68421,67951	8,98510
4834	3,68430,66461	8,98323
4835	3,68439,64784	8,98138
4836	3,68448,62922	8,97952
4837	3,68457,60874	8,97766
4838	3,68466,58640	8,97581
4839	3,68475,56221	8,97395
4840	3,68484,53616	8,97210
4841	3,68493,50826	8,97025
4842	3,68502,47851	8,96839
4843	3,68511,44690	8,96655
4844	3,68520,41345	8,96469
4845	3,68529,37814	8,96284
4846	3,68538,34098	8,96099
4847	3,68547,30197	8,95915
4848	3,68556,26112	8,95729
4849	3,68565,21841	8,95545
4850	3,68574,17386	8,95360
4851	3,68583,12746	8,95176
4852	3,68592,07922	8,94991
4853	3,68601,02913	8,94807
4854	3,68609,97720	8,94622
4855	3,68618,92342	8,94439
4856	3,68627,86781	8,94254
4857	3,68636,81035	8,94070
4858	3,68645,75105	8,93886
4859	3,68654,68991	8,93702
4860	3,68663,62693	8,93518

N.	Logarithmi	Differ.
4861	3,68672,56211	8,93334
4862	3,68681,49545	8,93151
4863	3,68690,42696	8,92967
4864	3,68699,35663	8,92783
4865	3,68708,28446	8,92600
4866	3,68717,21046	8,92416
4867	3,68726,13462	8,92234
4868	3,68735,05696	8,92049
4869	3,68743,97745	8,91867
4870	3,68752,89612	8,91684
4871	3,68761,81296	8,91500
4872	3,68770,72796	8,91318
4873	3,68779,64114	8,91134
4874	3,68788,55248	8,90952
4875	3,68797,46200	8,90769
4876	3,68806,36969	8,90587
4877	3,68815,27556	8,90404
4878	3,68824,17960	8,90221
4879	3,68833,08181	8,90039
4880	3,68841,98220	8,89857
4881	3,68850,88077	8,89674
4882	3,68859,77751	8,89492
4883	3,68868,67243	8,89310
4884	3,68877,56553	8,89128
4885	3,68886,45681	8,88945
4886	3,68895,34626	8,88764
4887	3,68904,23390	8,88582
4888	3,68913,11972	8,88401
4889	3,68922,00373	8,88218
4890	3,68930,88591	8,88037

N.	Logarithmi	Differ.
4891	3,68939,76628	8,87856
4892	3,68948,64484	8,87674
4893	3,68957,52158	8,87492
4894	3,68966,39650	8,87311
4895	3,68975,26961	8,87130
4896	3,68984,14091	8,86949
4897	3,68993,01040	8,86768
4898	3,69001,87808	8,86587
4899	3,69010,74395	8,86405
4900	3,69019,60800	8,86225
4901	3,69028,47025	8,86044
4902	3,69037,33069	8,85863
4903	3,69046,18932	8,85683
4904	3,69055,04615	8,85502
4905	3,69063,90117	8,85322
4906	3,69072,95439	8,85141
4907	3,69081,60580	8,84961
4908	3,69090,45541	8,84780
4909	3,69099,30321	8,84600
4910	3,69108,14921	8,84420
4911	3,69116,99341	8,84240
4912	3,69125,83581	8,84060
4913	3,69134,67641	8,83880
4914	3,69143,51521	8,83701
4915	3,69152,35222	8,83520
4916	3,69161,18742	8,83341
4917	3,69170,02083	8,83161
4918	3,69178,85244	8,82982
4919	3,69187,68226	8,82802
4920	3,69196,51028	8,82622

N.	Logarithmi	Differ.
4921	3,69205,33650	8,82444
4922	3,69214,16094	8,82264
4923	3,69222,98358	8,82685
4924	3,69231,80443	8,81905
4925	3,69240,62348	8,81727
4926	3,69249,44075	8,81548
4927	3,69258,25623	8,81369
4928	3,69267,06992	8,81197
4929	3,69275,88182	8,81011
4930	3,69284,69193	8,80832
4931	3,69293,50025	8,80654
4932	3,69302,30679	8,80476
4933	3,69311,11155	8,80297
4934	3,69319,91452	8,80118
4935	3,69328,71570	8,79940
4936	3,69337,51510	8,79762
4937	3,69346,31272	8,79584
4938	3,69355,10856	8,79406
4939	3,69363,90262	8,79227
4940	3,69372,69489	8,79050
4941	3,69381,48539	8,78872
4942	3,69390,27411	8,78694
4943	3,69399,06105	8,78516
4944	3,69407,84621	8,78338
4945	3,69416,62959	8,78161
4946	3,69425,41120	8,77984
4947	3,69434,19104	8,77806
4948	3,69442,96910	8,77628
4949	3,69451,74538	8,77451
4950	3,69460,51989	8,77274
4951	3,69469,29263	8,77097
4952	3,69478,06360	8,76920
4953	3,69486,83280	8,76742
4954	3,69495,60022	8,76566
4955	3,69504,36588	8,76389
4956	3,69513,12977	8,76212
4957	3,69521,89189	8,76035
4958	3,69530,65224	8,75859
4959	3,69539,41083	8,75682
4960	3,69548,16765	8,75505
4961	3,69556,92270	8,75329
4962	3,69565,67599	8,75153
4963	3,69574,42752	8,74976
4964	3,69583,17728	8,74800
4965	3,69591,92528	8,74624
4966	3,69600,67152	8,74448
4967	3,69609,41600	8,74272
4968	3,69618,15872	8,74095
4969	3,69626,89967	8,73920
4970	3,69635,63887	8,73744
4971	3,69644,37631	8,73569
4972	3,69653,11200	8,73392
4973	3,69661,84592	8,73217
4974	3,69670,57809	8,73042
4975	3,69679,30851	8,72866
4976	3,69688,03717	8,72690
4977	3,69696,76407	8,72516
4978	3,69705,48923	8,72340
4979	3,69714,21263	8,72165
4980	3,69722,93428	8,71989

N.	Logarithmi	Differ.
4981	3,69731,65417	8,71815
4982	3,69740,37232	8,71640
4983	3,69749,08872	8,71465
4984	3,69757,80337	8,71289
4985	3,69766,51626	8,71116
4986	3,69775,22742	8,70940
4987	3,69783,93682	8,70766
4988	3,69792,64448	8,70591
4989	3,69801,35039	8,70417
4990	3,69810,05456	8,70243
4991	3,69818,75699	8,70068
4992	3,69827,45767	8,69894
4993	3,69836,15661	8,69719
4994	3,69844,85380	8,69546
4995	3,69853,54926	8,69371
4996	3,69862,24297	8,69197
4997	3,69870,93494	8,69024
4998	3,69879,62518	8,68850
4999	3,69888,31368	8,68675
5000	3,69897,00043	8,68502
5001	3,69905,68545	8,68329
5002	3,69914,36874	8,68155
5003	3,69923,05029	8,67981
5004	3,69931,73010	8,67808
5005	3,69940,40818	8,67635
5006	3,69949,08453	8,67461
5007	3,69957,75914	8,67288
5008	3,69966,43202	8,67115
5009	3,69975,10317	8,66942
5010	3,69983,77259	8,66768

N.	Logarithmi	Differ.
5011	3,69992,44027	8,66596
5012	3,70001,10623	8,66423
5013	3,70009,77046	8,66250
5014	3,70018,43296	8,66078
5015	3,70027,09374	8,65904
5016	3,70035,75278	8,65732
5017	3,70044,41010	8,65560
5018	3,70053,06570	8,65387
5019	3,70061,71957	8,65214
5020	3,70070,37171	8,65043
5021	3,70079,02214	8,64870
5022	3,70087,67084	8,64698
5023	3,70096,31782	8,64525
5024	3,70104,96307	8,64354
5025	3,70113,60661	8,64182
5026	3,70122,24843	8,64009
5027	3,70130,88852	8,63838
5028	3,70139,52690	8,63666
5029	3,70148,16356	8,63495
5030	3,70156,79851	8,63322
5031	3,70165,43173	8,63151
5032	3,70174,06324	8,62980
5033	3,70182,69304	8,62808
5034	3,70191,32112	8,62637
5035	3,70199,94749	8,62465
5036	3,70208,57214	8,62295
5037	3,70217,19509	8,62123
5038	3,70225,81632	8,61952
5039	3,70234,43584	8,61780
5040	3,70243,05364	8,61610

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
5041	3,70251,66974	8,61439	5071	3,70509,36105	8,56344
5042	3,70260,28413	8,61269	5072	3,70517,92449	8,56174
5043	3,70268,89682	8,61097	5073	3,70526,48623	8,56006
5044	3,70277,50779	8,60927	5074	3,70535,04629	8,55837
5045	3,70286,11706	8,60756	5075	3,70543,60466	8,55668
5046	3,70294,72462	8,60585	5076	3,70552,16134	8,55500
5047	3,70303,33047	8,60415	5077	3,70560,71634	8,55331
5048	3,70311,93462	8,60245	5078	3,70569,26965	8,55163
5049	3,70320,53707	8,60074	5079	3,70577,82128	8,54995
5050	3,70329,13781	8,59904	5080	3,70586,37123	8,54826
5051	3,70337,73685	8,59734	5081	3,70594,91949	8,54658
5052	3,70346,33419	8,59563	5082	3,70603,46607	8,54490
5053	3,70354,92982	8,59394	5083	3,70612,01097	8,54322
5054	3,70363,52376	8,59223	5084	3,70620,55419	8,54154
5055	3,70372,11599	8,59054	5085	3,70629,09573	8,53985
5056	3,70380,70653	8,58883	5086	3,70637,63558	8,53818
5057	3,70389,29536	8,58714	5087	3,70646,17376	8,53650
5058	3,70397,88250	8,58544	5088	3,70654,71026	8,53483
5059	3,70406,46794	8,58374	5089	3,70663,24509	8,53314
5060	3,70415,05168	8,58205	5090	3,70671,77823	8,53147
5061	3,70423,63373	8,58035	5091	3,70680,30970	8,52980
5062	3,70432,21408	8,57866	5092	3,70688,83950	8,52812
5063	3,70440,79274	8,57696	5093	3,70697,36762	8,52644
5064	3,70449,36970	8,57527	5094	3,70705,89406	8,52477
5065	3,70457,94497	8,57358	5095	3,70714,41883	8,52310
5066	3,70466,51855	8,57188	5096	3,70722,94193	8,52143
5067	3,70475,09043	8,57019	5097	3,70731,46336	8,51975
5068	3,70483,66062	8,56850	5098	3,70739,98311	8,51809
5069	3,70492,22912	8,56681	5099	3,70748,50120	8,51641
5070	3,70500,79593	8,56512	5100	3,70757,01761	8,51474

N.	Logarithmi	Differ.
5101	3,70765,53235	8,51308
5102	3,70774,04543	8,51140
5103	3,70782,55683	8,50974
5104	3,70791,06657	8,50807
5105	3,70799,57464	8,50641
5106	3,70808,08105	8,50474
5107	3,70816,58579	8,50307
5108	3,70825,08886	8,50141
5109	3,70833,59027	8,49974
5110	3,70842,09001	8,49809
5111	3,70850,58810	8,49642
5112	3,70859,08452	8,49475
5113	3,70867,57927	8,49310
5114	3,70876,07237	8,49143
5115	3,70884,56380	8,48978
5116	3,70893,05358	8,48812
5117	3,70901,54170	8,48646
5118	3,70910,02816	8,48480
5119	3,70918,51296	8,48314
5120	3,70926,99610	8,48148
5121	3,70935,47758	8,47983
5122	3,70943,95741	8,47818
5123	3,70952,43559	8,47652
5124	3,70960,91211	8,47486
5125	3,70969,38697	8,47321
5126	3,70977,86018	8,47156
5127	3,70986,33174	8,46991
5128	3,70994,80165	8,46826
5129	3,71003,26991	8,46660
5130	3,71011,73651	8,46496

N.	Logarithmi	Differ.
5131	3,71020,20147	8,46330
5132	3,71028,66477	8,46166
5133	3,71037,12643	8,46000
5134	3,71045,58643	8,45836
5135	3,71054,04479	8,45672
5136	3,71062,50151	8,45506
5137	3,71070,95657	8,45342
5138	3,71079,40999	8,45178
5139	3,71087,86177	8,45013
5140	3,71096,31190	8,44849
5141	3,71104,76039	8,44684
5142	3,71113,20723	8,44520
5143	3,71121,65243	8,44356
5144	3,71130,09599	8,44192
5145	3,71138,53791	8,44028
5146	3,71146,97819	8,43864
5147	3,71155,41683	8,43699
5148	3,71163,85382	8,43536
5149	3,71172,28918	8,43372
5150	3,71180,72290	8,43209
5151	3,71189,15499	8,43045
5152	3,71197,58544	8,42881
5153	3,71206,01425	8,42717
5154	3,71214,44142	8,42554
5155	3,71222,86696	8,42391
5156	3,71231,29087	8,42227
5157	3,71239,71314	8,42064
5158	3,71248,13378	8,41901
5159	3,71256,55279	8,41737
5160	3,71264,97016	8,41575

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
5161	3,71273,38591	8,41411	5191	3,71525,10289	8,36549
5162	3,71281,80002	8,41248	5192	3,71533,46838	8,36388
5163	3,71290,21250	8,41086	5193	3,71541,83226	8,36227
5164	3,71298,62336	8,40923	5194	3,71550,19453	8,36066
5165	3,71307,03259	8,40759	5195	3,71558,55519	8,35905
5166	3,71315,44018	8,40597	5196	3,71566,91424	8,35744
5167	3,71323,84615	8,40435	5197	3,71575,27168	8,35584
5168	3,71332,25050	8,40272	5198	3,71583,62752	8,35422
5169	3,71340,65322	8,40109	5199	3,71591,98174	8,35262
5170	3,71349,05431	8,39947	5200	3,71600,33436	8,35102
5171	3,71357,45378	8,39784	5201	3,71608,68538	8,34941
5172	3,71365,85162	8,39622	5202	3,71617,03479	8,34780
5173	3,71374,24784	8,39460	5203	3,71625,38259	8,34620
5174	3,71382,64244	8,39297	5204	3,71633,72879	8,34459
5175	3,71391,03541	8,39136	5205	3,71642,07338	8,34300
5176	3,71399,42677	8,38973	5206	3,71650,41638	8,34139
5177	3,71407,81650	8,38811	5207	3,71658,75777	8,33979
5178	3,71416,20461	8,38649	5208	3,71667,09756	8,33818
5179	3,71424,59110	8,38487	5209	3,71675,43574	8,33659
5180	3,71432,97597	8,38326	5210	3,71683,77233	8,33499
5181	3,71441,35923	8,38163	5211	3,71692,10732	8,33338
5182	3,71449,74086	8,38002	5212	3,71700,44070	8,33179
5183	3,71458,12088	8,37841	5213	3,71708,77249	8,33019
5184	3,71466,49929	8,37678	5214	3,71717,10268	8,32860
5185	3,71474,87607	8,37517	5215	3,71725,43128	8,32699
5186	3,71483,25124	8,37356	5216	3,71733,75827	8,32540
5187	3,71491,62480	8,37194	5217	3,71742,08367	8,32381
5188	3,71499,99674	8,37033	5218	3,71750,40748	8,32221
5189	3,71508,36707	8,36871	5219	3,71758,72969	8,32061
5190	3,71516,73578	8,36711	5220	3,71767,05030	8,31902

N.	Logarithmi	Differ.
5221	3,71775,36932	8,31743
5222	3,71783,38675	8,31583
5223	3,71792,00258	8,31425
5224	3,71800,31683	8,31265
5225	3,71808,62948	8,31106
5226	3,71816,94054	8,30947
5227	3,71825,25001	8,30788
5228	3,71833,55789	8,30629
5229	3,71841,86418	8,30471
5230	3,71850,16889	8,30311
5231	3,71858,47200	8,30153
5232	3,71866,77353	8,29994
5233	3,71875,07347	8,29836
5234	3,71883,37183	8,29677
5235	3,71891,66860	8,29519
5236	3,71899,96379	8,29360
5237	3,71908,25739	8,29202
5238	3,71916,54941	8,29043
5239	3,71924,83984	8,28886
5240	3,71933,12870	8,28727
5241	3,71941,41597	8,28569
5242	3,71949,70166	8,28411
5243	3,71957,98577	8,28253
5244	3,71966,26830	8,28095
5245	3,71974,54925	8,27938
5245	3,71982,82863	8,27779
5247	3,71991,10642	8,27622
5248	3,71999,38264	8,27464
5249	3,72007,65728	8,27306
5250	3,72015,93034	8,27149

N.	Logarithmi	Differ.
5251	3,72024,20183	8,26991
5252	3,72032,47174	8,26834
5253	3,72040,74008	8,26677
5254	3,72049,00685	8,26519
5255	3,72057,27204	8,26362
5256	3,72065,53566	8,26204
5257	3,72073,79770	8,26048
5258	3,72082,05818	8,25890
5259	3,72090,31708	8,25734
5260	3,72098,57442	8,25576
5261	3,72106,83018	8,25419
5262	3,72115,08437	8,25263
5263	3,72123,33700	8,25106
5264	3,72131,58806	8,24949
5265	3,72139,83755	8,24793
5266	3,72148,08548	8,24636
5267	3,72156,33184	8,24479
5268	3,72164,57663	8,24323
5269	3,72172,81986	8,24166
5270	3,72181,06152	8,24010
5271	3,72189,30162	8,23854
5272	3,72197,54016	8,23697
5273	3,72205,77713	8,23542
5274	3,72214,01255	8,23385
5275	3,72222,24640	8,23229
5276	3,72230,47869	8,23073
5277	3,72238,70942	8,22917
5278	3,72246,93859	8,22761
5279	3,72255,16620	8,22605
5280	3,72263,39225	8,22450

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
5281	3,72271,61675	8,22294	5311	3,72517,63014	8,17650
5282	3,72279,83969	8,22138	5312	3,72525,80664	8,17495
5283	3,72288,06107	8,21982	5313	3,72533,98159	8,17342
5284	3,72296,28089	8,21827	5314	3,72542,15501	8,17188
5285	3,72304,49916	8,21672	5315	3,72550,32689	8,17034
5286	3,72312,71588	8,21516	5316	3,72558,49723	8,16880
5287	3,72320,93104	8,21361	5317	3,72566,66603	8,16727
5288	3,72329,14465	8,21205	5318	3,72574,83330	8,16573
5289	3,72337,35670	8,21050	5319	3,72582,99903	8,16420
5290	3,72345,56720	8,20895	5320	3,72591,16323	8,16266
5291	3,72353,77615	8,20740	5321	3,72599,32589	8,16113
5292	3,72361,98355	8,20585	5322	3,72607,48702	8,15960
5293	3,72370,18940	8,20430	5323	3,72615,64662	8,15806
5294	3,72378,39370	8,20274	5324	3,72623,80468	8,15653
5295	3,72386,59644	8,20120	5325	3,72631,96121	8,15500
5296	3,72394,79764	8,19965	5326	3,72640,11621	8,15347
5297	3,72402,99729	8,19811	5327	3,72648,26968	8,15194
5298	3,72411,19540	8,19655	5328	3,72656,42162	8,15040
5299	3,72419,39195	8,19501	5329	3,72664,57202	8,14888
5300	3,72427,58696	8,19346	5330	3,72672,72090	8,14735
5301	3,72435,78042	8,19192	5331	3,72680,86825	8,14582
5302	3,72443,97234	8,19037	5332	3,72689,01407	8,14430
5303	3,72452,16271	8,18883	5333	3,72697,15837	8,14277
5304	3,72460,35154	8,18728	5334	3,72705,30114	8,14124
5305	3,72468,53882	8,18574	5335	3,72713,44238	8,13971
5306	3,72476,72456	8,18420	5336	3,72721,58209	8,13819
5307	3,72484,90876	8,18266	5337	3,72729,72028	8,13667
5308	3,72493,09142	8,18111	5338	3,72737,85695	8,13514
5309	3,72501,27253	8,17958	5339	3,72745,99209	8,13361
5310	3,72509,45211	8,17803	5340	3,72754,12570	8,13210

N.	Logarithmi	Differ.
5341	3,72762,25780	8,13057
5342	3,72770,38837	8,12905
5343	3,72778,51742	8,12753
5344	3,72786,64495	8,12600
5345	3,72794,77095	8,12449
5346	3,72802,89544	8,12297
5347	3,72811,01841	8,12145
5348	3,72819,13986	8,11993
5349	3,72827,25979	8,11841
5350	3,72835,37820	8,11690
5351	3,72843,49510	8,11538
5352	3,72851,61048	8,11386
5353	3,72859,72434	8,11235
5354	3,72867,83669	8,11083
5355	3,72875,94752	8,10931
5356	3,72884,05683	8,10781
5357	3,72892,16464	8,10629
5358	3,72900,27093	8,10477
5359	3,72908,37570	8,10327
5360	3,72916,47897	8,10175
5361	3,72924,58072	8,10024
5362	3,72932,68096	8,09874
5363	3,72940,77970	8,09722
5364	3,72948,87692	8,09571
5365	3,72956,97263	8,09420
5366	3,72965,06683	8,09270
5367	3,72973,15953	8,09119
5368	3,72981,25072	8,08968
5369	3,72989,34040	8,08817
5370	3,72997,42857	8,08667

N.	Logarithmi	Differ.
5371	3,73005,51524	8,08516
5372	3,73013,60040	8,08366
5373	3,73021,68406	8,08215
5374	3,73029,76621	8,08065
5375	3,73037,84686	8,07914
5376	3,73045,92600	8,07765
5377	3,73054,00365	8,07614
5378	3,73062,07979	8,07464
5379	3,73070,15443	8,07314
5380	3,73078,22757	8,07163
5381	3,73086,29920	8,07014
5382	3,73094,36934	8,06864
5383	3,73102,43798	8,06714
5384	3,73110,50512	8,06564
5385	3,73118,57076	8,06415
5386	3,73126,63491	8,06264
5387	3,73134,69755	8,06116
5388	3,73142,75871	8,05965
5389	3,73150,81836	8,05816
5390	3,73158,87652	8,05666
5391	3,73166,93318	8,05517
5392	3,73174,98835	8,05368
5393	3,73183,04203	8,05218
5394	3,73191,09421	8,05069
5395	3,73199,14490	8,04920
5396	3,73207,19410	8,04771
5397	3,73215,24181	8,04621
5398	3,73223,28802	8,04473
5399	3,73231,33275	8,04323
5400	3,73239,37598	8,04175

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
5401	3,73247,41773	8,04026	5431	3,73487,98028	7,99585
5402	3,73255,45799	8,03876	5432	3,73495,97613	7,99437
5403	3,73263,49675	8,03728	5433	3,73503,97050	7,99291
5404	3,73271,53403	8,03580	5434	3,73511,96341	7,99143
5405	3,73279,56983	8,03431	5435	3,73519,95484	7,98997
5406	3,73287,60414	8,03282	5436	3,73527,94481	7,98849
5407	3,73295,63696	8,03133	5437	3,73535,93330	7,98703
5408	3,73303,66829	8,02985	5438	3,73543,92033	7,98555
5409	3,73311,69814	8,02837	5439	3,73551,90588	7,98409
5410	3,73319,72651	8,02688	5440	3,73559,88997	7,98262
5411	3,73327,75339	8,02540	5441	3,73567,87259	7,98115
5412	3,73335,77879	8,02392	5442	3,73575,85374	7,97969
5413	3,73343,80271	8,02243	5443	3,73583,83343	7,97822
5414	3,73351,82514	8,02096	5444	3,73591,81165	7,97676
5415	3,73359,84610	8,01947	5445	3,73599,78841	7,97529
5416	3,73367,86557	8,01799	5446	3,73607,76370	7,97383
5417	3,73375,88356	8,01651	5447	3,73615,73753	7,97236
5418	3,73383,90007	8,01503	5448	3,73623,70989	7,97090
5419	3,73391,91510	8,01355	5449	3,73631,68079	7,96944
5420	3,73399,92865	8,01208	5450	3,73639,65023	7,96797
5421	3,73407,94073	8,01059	5451	3,73647,61820	7,96652
5422	3,73415,95132	8,00912	5452	3,73655,58472	7,96505
5423	3,73423,96044	8,00765	5453	3,73663,54977	7,96359
5424	3,73431,96809	8,00616	5454	3,73671,51336	7,96213
5425	3,73439,97425	8,00469	5455	3,73679,47549	7,96067
5426	3,73447,97894	8,00322	5456	3,73687,43616	7,95922
5427	3,73455,98216	8,00174	5457	3,73695,39538	7,95775
5428	3,73463,98370	8,00027	5458	3,73703,35313	7,95630
5429	3,73471,98417	7,99879	5459	3,73711,30943	7,95484
5430	3,73479,98296	7,99732	5460	3,73719,26427	7,95338

N.	Logarithmi	Differ.
5461	3,73727,21765	7,95193
5462	3,73735,16958	7,95047
5463	3,73743,12005	7,94902
5464	3,73751,06907	7,94756
5465	3,73759,01663	7,94611
5466	3,73766,96274	7,94465
5467	3,73774,90739	7,94320
5468	3,73782,85059	7,94175
5469	3,73790,79234	7,94029
5470	3,73798,73263	7,93885
5471	3,73806,67148	7,93739
5472	3,73814,60887	7,93594
5473	3,73822,54481	7,93450
5474	3,73830,47931	7,93304
5475	3,73838,41235	7,93160
5476	3,73846,34395	7,93014
5477	3,73854,27409	7,92870
5478	3,73862,20279	7,92725
5479	3,73870,13004	7,92581
5480	3,73878,05585	7,92436
5481	3,73885,98021	7,92291
5482	3,73893,90312	7,92147
5483	3,73901,82459	7,92002
5484	3,73909,74461	7,91858
5485	3,73917,66319	7,91714
5486	3,73925,58033	7,91569
5487	3,73933,49602	7,91425
5488	3,73941,41027	7,91281
5489	3,73949,32308	7,91137
5490	3,73957,23445	7,90992

N.	Logarithmi	Differ.
5491	3,73965,14437	7,90849
5492	3,73973,05286	7,90704
5493	3,73980,95990	7,90561
5494	3,73988,86551	7,90417
5495	3,73996,76968	7,90273
5496	3,74004,67241	7,90129
5497	3,74012,57370	7,89985
5498	3,74020,47355	7,89842
5499	3,74028,37197	7,89698
5500	3,74036,26895	7,89554
5501	3,74044,16449	7,89412
5502	3,74052,05861	7,89267
5503	3,74059,95128	7,89124
5504	3,74067,84252	7,88981
5505	3,74075,73233	7,88838
5506	3,74083,62071	7,88694
5507	3,74091,50765	7,88551
5508	3,74099,39316	7,88408
5509	3,74107,27724	7,88265
5510	3,74115,15989	7,88121
5511	3,74123,04110	7,87979
5512	3,74130,92089	7,87836
5513	3,74138,79925	7,87693
5514	3,74146,67618	7,87550
5515	3,74154,55168	7,87407
5516	3,74162,42575	7,87265
5517	3,74170,29840	7,87121
5518	3,74178,16961	7,86980
5519	3,74186,03941	7,86836
5520	3,74193,90777	7,86694

N.	Logarithmi	Differ.
5521	3,74201,77471	7,86552
5522	3,74209,64023	7,86409
5523	3,74217,50432	7,86267
5524	3,74225,36699	7,86125
5525	3,74233,22824	7,85982
5526	3,74241,08806	7,85840
5527	3,74248,94646	7,85698
5528	3,74256,80344	7,85555
5529	3,74264,65899	7,85414
5530	3,74272,51313	7,85272
5531	3,74280,36585	7,85129
5532	3,74288,21714	7,84988
5533	3,74296,06702	7,84846
5534	3,74303,91548	7,84704
5535	3,74311,76252	7,84562
5536	3,74319,60814	7,84421
5537	3,74327,45235	7,84279
5538	3,74335,29514	7,84137
5539	3,74343,13651	7,83996
5540	3,74350,97647	7,83855
5541	3,74358,81502	7,83712
5542	3,74366,65214	7,83572
5543	3,74374,48786	7,83430
5544	3,74382,32216	7,83289
5545	3,74390,15505	7,83147
5546	3,74397,98652	7,83007
5547	3,74405,81659	7,82865
5548	3,74413,64524	7,82724
5549	3,74421,47248	7,82583
5550	3,74429,29831	7,82442

N.	Logarithmi	Differ.
5551	3,74437,12273	7,82301
5552	3,74444,94574	7,82161
5553	3,74452,76735	7,82019
5554	3,74460,58754	7,81879
5555	3,74468,40633	7,81738
5556	3,74476,22371	7,81597
5557	3,74484,03968	7,81456
5558	3,74491,85424	7,81316
5559	3,74499,66740	7,81176
5560	3,74507,47916	7,81035
5561	3,74515,28951	7,80894
5562	3,74523,09845	7,80754
5563	3,74530,90599	7,80614
5564	3,74538,71213	7,80474
5565	3,74546,51687	7,80333
5566	3,74554,32020	7,80193
5567	3,74562,12213	7,80053
5568	3,74569,92266	7,79913
5569	3,74577,72179	7,79773
5570	3,74585,51952	7,79633
5571	3,74593,31585	7,79493
5572	3,74601,11078	7,79353
5573	3,74608,90431	7,79213
5574	3,74616,69644	7,79073
5575	3,74624,48717	7,78934
5576	3,74632,27651	7,78794
5577	3,74640,06445	7,78654
5578	3,74647,85099	7,78515
5579	3,74655,63614	7,78375
5580	3,74663,41989	7,78236

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
5581	3,74671,20225	7,78097	5611	3,74904,02687	7,73937
5582	3,74678,98322	7,77957	5612	3,74911,76624	7,73798
5583	3,74686,76279	7,77817	5613	3,74919,50422	7,73661
5584	3,74694,54096	7,77679	5614	3,74927,24083	7,73523
5585	3,74702,31775	7,77539	5615	3,74934,97606	7,73385
5586	3,74710,09314	7,77400	5616	3,74942,70991	7,73248
5587	3,74717,86714	7,77260	5617	3,74950,44239	7,73110
5588	3,74725,63974	7,77122	5618	3,74958,17349	7,72972
5589	3,74733,41096	7,76983	5619	3,74965,90321	7,72835
5590	3,74741,18079	7,76844	5620	3,74973,63156	7,72697
5591	3,74748,94923	7,76704	5621	3,74981,35853	7,72560
5592	3,74756,71627	7,76566	5622	3,74989,08413	7,72422
5593	3,74764,48193	7,76427	5623	3,74996,80835	7,72285
5594	3,74772,28620	7,76289	5624	3,75004,53120	7,72148
5595	3,74780,00909	7,76149	5625	3,75012,25268	7,72010
5596	3,74787,77058	7,76011	5626	3,75019,97278	7,71874
5597	3,74795,53069	7,75872	5627	3,75027,69152	7,71736
5598	3,74803,28941	7,75734	5628	3,75035,40888	7,71599
5599	3,74811,04675	7,75595	5629	3,75043,12487	7,71462
5600	3,74818,80270	7,75457	5630	3,75050,83949	7,71324
5601	3,74826,55727	7,75318	5631	3,75058,55273	7,71188
5602	3,74834,31045	7,75180	5632	3,75066,26461	7,71051
5603	3,74842,06225	7,75041	5633	3,75073,97512	7,70914
5604	3,74849,81266	7,74903	5634	3,75081,68426	7,70778
5605	3,74857,56169	7,74765	5635	3,75089,39204	7,70640
5606	3,74865,30934	7,74627	5636	3,75097,09844	7,70504
5607	3,74873,05561	7,74489	5637	3,75104,80348	7,70367
5608	3,74880,80050	7,74350	5638	3,75112,50715	7,70231
5609	3,74888,54400	7,74213	5639	3,75120,20946	7,70094
5610	3,74896,28613	7,74074	5640	3,75127,91040	7,69957

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
5641	3,75135,60997	7,69821	5671	3,75365,96473	7,65749
5642	3,75143,30818	7,69685	5672	3,75373,62222	7,65614
5643	3,75151,00503	7,69548	5673	3,75381,27836	7,65479
5644	3,75158,70051	7,69412	5674	3,75388,93315	7,65344
5645	3,75166,39463	7,69275	5675	3,75396,58659	7,65209
5646	3,75174,08738	7,69139	5676	3,75404,23868	7,65074
5647	3,75181,77877	7,69003	5677	3,75411,88942	7,64940
5648	3,75189,46880	7,68867	5678	3,75419,53882	7,64805
5649	3,75197,15747	7,68731	5679	3,75427,18687	7,64670
5650	3,75204,84478	7,68595	5680	3,75434,83357	7,64536
5651	3,75212,53073	7,68459	5681	3,75442,47893	7,64401
5652	3,75220,21532	7,68323	5682	3,75450,12294	7,64266
5653	3,75227,89855	7,68187	5683	3,75457,76560	7,64133
5654	3,75235,58042	7,68051	5684	3,75465,40693	7,63997
5655	3,75243,26093	7,67915	5685	3,75473,04690	7,63864
5656	3,75250,94008	7,67779	5686	3,75480,68554	7,63729
5657	3,75258,61787	7,67644	5687	3,75488,32283	7,63594
5658	3,75266,29431	7,67508	5688	3,75495,95877	7,63461
5659	3,75273,96939	7,67373	5689	3,75503,59338	7,63326
5660	3,75281,64312	7,67237	5690	3,75511,22664	7,63192
5661	3,75289,31549	7,67101	5691	3,75518,85856	7,63058
5662	3,75296,98650	7,66966	5692	3,75526,48914	7,62924
5663	3,75304,65616	7,66831	5693	3,75534,11838	7,62790
5664	3,75312,32447	7,66695	5694	3,75541,74628	7,62656
5665	3,75319,99142	7,66560	5695	3,75549,37284	7,62522
5666	3,75327,65702	7,66424	5696	3,75556,99806	7,62389
5667	3,75335,32126	7,66290	5697	3,75564,62195	7,62254
5668	3,75342,98416	7,66154	5698	3,75572,24449	7,62121
5669	3,75350,64570	7,66019	5699	3,75579,86570	7,61987
5670	3,75358,30589	7,65884	5700	3,75587,48557	7,61853

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
5701	3,75595,10410	7,61720	5731	3,75823,04085	7,57732
5702	3,75602,72130	7,61586	5732	3,75830,61817	7,57601
5703	3,75610,33716	7,61452	5733	3,75838,19418	7,57468
5704	3,75617,95168	7,61320	5734	3,75845,76886	7,57336
5705	3,75625,56488	7,61185	5735	3,75853,34222	7,57205
5706	3,75633,17673	7,61052	5736	3,75860,91427	7,57072
5707	3,75640,78725	7,60919	5737	3,75868,48499	7,56940
5708	3,75648,39644	7,60786	5738	3,75876,05439	7,56808
5709	3,75656,00430	7,60652	5739	3,75883,62247	7,56677
5710	3,75663,61082	7,60520	5740	3,75891,18924	7,56545
5711	3,75671,21602	7,60386	5741	3,75898,75469	7,56413
5712	3,75678,81988	7,60253	5742	3,75906,31882	7,56281
5713	3,75686,42241	7,60119	5743	3,75913,88163	7,56149
5714	3,75694,02360	7,59987	5744	3,75921,44312	7,56018
5715	3,75701,62347	7,59854	5745	3,75929,00330	7,55887
5716	3,75709,22201	7,59721	5746	3,75936,56217	7,55754
5717	3,75716,81922	7,59588	5747	3,75944,11971	7,55624
5718	3,75724,41510	7,59455	5748	3,75951,67595	7,55491
5719	3,75732,00965	7,59323	5749	3,75959,23086	7,55361
5720	3,75739,60288	7,59190	5750	3,75966,78447	7,55229
5721	3,75747,19478	7,59057	5751	3,75974,33676	7,55098
5722	3,75754,78535	7,58924	5752	3,75981,88774	7,54966
5723	3,75762,37459	7,58792	5753	3,75989,43740	7,54836
5724	3,75769,96251	7,58659	5754	3,75996,98576	7,54704
5725	3,75777,54910	7,58527	5755	3,76004,53280	7,54573
5726	3,75785,13437	7,58394	5756	3,76012,07853	7,54442
5727	3,75792,71831	7,58262	5757	3,76019,62295	7,54310
5728	3,75800,30093	7,58129	5758	3,76027,16605	7,54180
5729	3,75807,88222	7,57998	5759	3,76034,70785	7,54049
5730	3,75815,46220	7,57865	5760	3,76042,24834	7,53918

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
5761	3,76049,78752	7,53787	5791	3,76275,35649	7,49883
5762	3,76057,32593	7,53657	5792	3,76282,85532	7,49753
5763	3,76064,86196	7,53525	5793	3,76290,35285	7,49624
5764	3,76072,39721	7,53395	5794	3,76297,84909	7,49494
5765	3,76079,93116	7,53265	5795	3,76305,34403	7,49365
5766	3,76087,46381	7,53133	5796	3,76312,83768	7,49236
5767	3,76094,94514	7,53003	5797	3,76320,33004	7,49106
5768	3,76102,52517	7,52873	5798	3,76327,82110	7,48977
5769	3,76110,05390	7,52742	5799	3,76335,31087	7,48849
5770	3,76117,58132	7,52611	5800	3,76342,79936	7,48719
5771	3,76125,10743	7,52481	5801	3,76350,28655	7,48590
5772	3,76132,63224	7,52351	5802	3,76357,77245	7,48461
5773	3,76140,15575	7,52220	5803	3,76365,25706	7,48332
5774	3,76147,67795	7,52091	5804	3,76372,74038	7,48203
5775	3,76155,19886	7,51960	5805	3,76380,22241	7,48074
5776	3,76162,71846	7,51829	5806	3,76387,70315	7,47945
5777	3,76170,23675	7,51700	5807	3,76395,18260	7,47817
5778	3,76177,75375	7,51570	5808	3,76402,66077	7,47688
5779	3,76185,26945	7,51439	5809	3,76410,13765	7,47559
5780	3,76192,78384	7,51310	5810	3,76417,61324	7,47430
5781	3,76200,29694	7,51179	5811	3,76425,08754	7,47302
5782	3,76207,80873	7,51050	5812	3,76432,56056	7,47174
5783	3,76215,31923	7,50920	5813	3,76440,03230	7,47044
5784	3,76222,82843	7,50790	5814	3,76447,50274	7,46917
5785	3,76230,33633	7,50660	5815	3,76454,97191	7,46788
5786	3,76237,84293	7,50531	5816	3,76462,43979	7,46659
5787	3,76245,34824	7,50400	5817	3,76469,90638	7,46531
5788	3,76252,85224	7,50272	5818	3,76477,37169	7,46403
5789	3,76260,35496	7,50141	5819	3,76484,83572	7,46274
5790	3,76267,85637	7,50012	5820	3,76492,29846	7,46147

N.	Logarithmi	Differ.
5821	3,76499,75993	7,46018
5822	3,76507,22011	7,45890
5823	3,76514,67901	7,45762
5824	3,76522,13633	7,45634
5825	3,76529,59297	7,45506
5826	3,76537,04803	7,45378
5827	3,76544,50181	7,45250
5828	3,76551,95431	7,45122
5829	3,76559,40553	7,44995
5830	3,76566,85548	7,44866
5831	3,76574,30414	7,44739
5832	3,76581,75153	7,44611
5833	3,76589,19764	7,44484
5834	3,76596,64248	7,44356
5835	3,76604,08604	7,44228
5836	3,76611,52832	7,44101
5837	3,76618,96933	7,43974
5838	3,76626,40907	7,43846
5839	3,76633,84753	7,43718
5840	3,76641,28471	7,43591
5841	3,76648,72062	7,43464
5842	3,76656,15526	7,43337
5843	3,76663,58863	7,43210
5844	3,76671,07073	7,43082
5845	3,76678,45155	7,42955
5846	3,76685,88110	7,42828
5847	3,76693,30938	7,42701
5848	3,76700,73639	7,42575
5849	3,76708,16214	7,42447
5850	3,76715,58661	7,42320

N.	Logarithmi	Differ.
5851	3,76723,00981	7,42194
5852	3,76730,43175	7,42066
5853	3,76737,85241	7,41940
5854	3,76745,27181	7,41813
5855	3,76752,68994	7,41687
5856	3,76760,10681	7,41559
5857	3,76767,52240	7,41433
5858	3,76774,93673	7,41307
5859	3,76782,34980	7,41180
5860	3,76789,76160	7,41054
5861	3,76797,17214	7,40927
5862	3,76804,58141	7,40801
5863	3,76811,98942	7,40674
5864	3,76819,39616	7,40549
5865	3,76826,80165	7,40421
5866	3,76834,20586	7,40296
5867	3,76841,60882	7,40170
5868	3,76849,01052	7,40043
5869	3,76856,41095	7,39917
5870	3,76863,81012	7,39792
5871	3,76871,20804	7,39665
5872	3,76878,60469	7,39539
5873	3,76886,00008	7,39414
5874	3,76893,39422	7,39287
5875	3,76900,78709	7,39162
5876	3,76908,17871	7,39036
5877	3,76915,56907	7,38910
5878	3,76922,95817	7,38785
5879	3,76930,34602	7,38659
5880	3,76937,73261	7,38533

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
5881	3,76945,11794	7,38408	5911	3,77166,09593	7,34661
5882	3,76952,50202	7,38282	5912	3,77173,44254	7,34536
5883	3,76959,88484	7,38157	5913	3,77180,78790	7,34412
5884	3,76967,26641	7,38031	5914	3,77188,13202	7,34288
5885	3,76974,64672	7,37906	5915	3,77195,47490	7,34163
5886	3,76982,02578	7,37780	5916	3,77202,81653	7,34040
5887	3,76989,40358	7,37655	5917	3,77210,15693	7,33915
5888	3,76996,78013	7,37530	5918	3,77217,49608	7,33792
5889	3,77004,15543	7,37405	5919	3,77224,83400	7,33667
5890	3,77011,52948	7,37279	5920	3,77232,17067	7,33544
5891	3,77018,90227	7,37155	5921	3,77239,50611	7,33420
5892	3,77026,27382	7,37029	5922	3,77246,84031	7,33295
5893	3,77033,64411	7,36904	5923	3,77254,17326	7,33172
5894	3,77041,01315	7,36779	5924	3,77261,50498	7,33049
5895	3,77048,38094	7,36655	5925	3,77268,83547	7,32924
5896	3,77055,74749	7,36529	5926	3,77276,16471	7,32801
5897	3,77063,11278	7,36404	5927	3,77283,49272	7,32678
5898	3,77070,47682	7,36280	5928	3,77290,81950	7,32553
5899	3,77077,83962	7,36154	5929	3,77298,14503	7,32431
5900	3,77085,20116	7,36030	5930	3,77305,46934	7,32306
5901	3,77092,56146	7,35906	5931	3,77312,79240	7,32184
5902	3,77099,92052	7,35780	5932	3,77320,11424	7,32059
5903	3,77107,27832	7,35656	5933	3,77327,43483	7,31937
5904	3,77114,63488	7,35531	5934	3,77334,75420	7,31813
5905	3,77121,99019	7,35407	5935	3,77342,07233	7,31690
5906	3,77129,34426	7,35283	5936	3,77349,38923	7,31566
5907	3,77136,69709	7,35157	5937	3,77356,70489	7,31444
5908	3,77144,04866	7,35034	5938	3,77364,01933	7,31320
5909	3,77151,39900	7,34909	5939	3,77371,33253	7,31197
5910	3,77158,74809	7,34784	5940	3,77378,64450	7,31074

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
5941	3,77385,95524	7,30951	5971	3,77604,70712	7,27279
5942	3,77393,26475	7,30828	5972	3,77611,97991	7,27156
5943	3,77400,57303	7,30705	5973	3,77619,25147	7,27036
5944	3,77407,88008	7,30582	5974	3,77626,52183	7,26913
5945	3,77415,18590	7,30459	5975	3,77633,79096	7,26792
5946	3,77422,49049	7,30336	5976	3,77641,05888	7,26670
5947	3,77429,79385	7,30213	5977	3,77648,32558	7,26549
5948	3,77437,09598	7,30091	5978	3,77655,59107	7,26427
5949	3,77444,39689	7,29968	5979	3,77662,85534	7,26306
5950	3,77451,69657	7,29846	5980	3,77670,11840	7,26184
5951	3,77458,99503	7,29722	5981	3,77677,38024	7,26063
5952	3,77466,29225	7,29601	5982	3,77684,64087	7,25941
5953	3,77473,58826	7,29477	5983	3,77691,90028	7,25821
5954	3,77480,88303	7,29355	5984	3,77699,15849	7,25698
5955	3,77488,17658	7,29233	5985	3,77706,41547	7,25578
5956	3,77495,46891	7,29110	5986	3,77713,67125	7,25456
5957	3,77502,76001	7,28988	5987	3,77720,92581	7,25336
5958	3,77510,04989	7,28865	5988	3,77728,17917	7,25214
5959	3,77517,33854	7,28743	5989	3,77735,43131	7,25093
5960	3,77524,62597	7,28621	5990	3,77742,68224	7,24972
5961	3,77531,91218	7,28499	5991	3,77749,93196	7,24851
5962	3,77539,19717	7,28376	5992	3,77757,18047	7,24730
5963	3,77546,48093	7,28255	5993	3,77764,42777	7,24609
5964	3,77553,76348	7,28132	5994	3,77771,67386	7,24488
5965	3,77561,04480	7,28010	5995	3,77778,91874	7,24368
5966	3,77568,32490	7,27888	5996	3,77786,16242	7,24246
5967	3,77575,60378	7,27767	5997	3,77793,40488	7,24126
5968	3,77582,88145	7,27644	5998	3,77800,64614	7,24005
5969	3,77590,15789	7,27522	5999	3,77807,88619	7,23885
5970	3,77597,43311	7,27401	6000	3,77815,12504	7,23764

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
6001	3,77822,36268	7,23643	6031	3,78038,93285	7,20044
6002	3,77829,59911	7,23523	6032	3,78046,13329	7,19924
6003	3,77836,83434	7,23402	6033	3,78053,33253	7,19805
6004	3,77844,06836	7,23281	6034	3,78060,53058	7,19686
6005	3,77851,30117	7,23162	6035	3,78067,72744	7,19567
6006	3,77858,53279	7,23040	6036	3,78074,92311	7,19448
6007	3,77865,76319	7,22921	6037	3,78082,11759	7,19328
6008	3,77872,99240	7,22800	6038	3,78089,31087	7,19209
6009	3,77880,22040	7,22680	6039	3,78096,50296	7,19090
6010	3,77887,44720	7,22560	6040	3,78103,69386	7,18971
6011	3,77894,67280	7,22439	6041	3,78110,88357	7,18852
6012	3,77901,89719	7,22319	6042	3,78118,07209	7,18733
6013	3,77909,12038	7,22200	6043	3,78125,25942	7,18615
6014	3,77916,34238	7,22079	6044	3,78132,44557	7,18495
6015	3,77923,56317	7,21959	6045	3,78139,63052	7,18376
6016	3,77930,78276	7,21839	6046	3,78146,81428	7,18258
6017	3,77938,00115	7,21719	6047	3,78153,99686	7,18139
6018	3,77945,21834	7,21599	6048	3,78161,17825	7,18020
6019	3,77952,43433	7,21480	6049	3,78168,35845	7,17902
6020	3,77959,64913	7,21359	6050	3,78175,53747	7,17782
6021	3,77966,86272	7,21240	6051	3,78182,71529	7,17665
6022	3,77974,07512	7,21120	6052	3,78189,89194	7,17545
6023	3,77981,28632	7,21000	6053	3,78197,06739	7,17427
6024	3,77988,49632	7,20880	6054	3,78204,24166	7,17309
6025	3,77995,70512	7,20761	6055	3,78211,41475	7,17190
6026	3,78002,91273	7,20642	6056	3,78218,58665	7,17072
6027	3,78010,11915	7,20521	6057	3,78225,75737	7,16953
6028	3,78017,32436	7,20403	6058	3,78232,92690	7,16835
6029	3,78024,52839	7,20282	6059	3,78240,09525	7,16717
6030	3,78031,73121	7,20164	6060	3,78247,26242	7,16598

N.	Logarithmi	Differ.
6061	3,78254,42840	7,16480
6062	3,78261,59320	7,16362
6063	3,78268,75682	7,16244
6064	3,78275,91926	7,16126
6065	3,78283,08052	7,16008
6066	3,78290,24060	7,15889
6067	3,78297,39949	7,15772
6068	3,78304,55721	7,15654
6069	3,78311,71375	7,15536
6070	3,78318,86911	7,15418
6071	3,78326,02329	7,15300
6072	3,78333,17629	7,15182
6073	3,78340,32811	7,15065
6074	3,78347,47876	7,14947
6075	3,78354,62823	7,14829
6076	3,78361,77652	7,14711
6077	3,78368,92363	7,14594
6078	3,78376,06957	7,14477
6079	3,78383,21434	7,14359
6080	3,78390,35793	7,14241
6081	3,78397,50034	7,14124
6082	3,78404,64158	7,14007
6083	3,78411,78165	7,13889
6084	3,78418,92054	7,13772
6085	3,78426,05826	7,13654
6086	3,78433,19480	7,13538
6087	3,78440,33018	7,13420
6088	3,78447,46438	7,13303
6089	3,78454,59741	7,13185
6090	3,78461,72926	7,13069

N.	Logarithmi	Differ.
6091	3,78468,85995	7,12952
6092	3,78475,98947	7,12834
6093	3,78483,11781	7,12718
6094	3,78490,24499	7,12601
6095	3,78497,37100	7,12483
6096	3,78504,49583	7,12367
6097	3,78511,61950	7,12250
6098	3,78518,74200	7,12134
6099	3,78525,86334	7,12016
6100	3,78532,98350	7,11900
6101	3,78540,10250	7,11783
6102	3,78547,22033	7,11667
6103	3,78554,33700	7,11549
6104	3,78561,45249	7,11434
6105	3,78568,56683	7,11317
6106	3,78575,68000	7,11200
6107	3,78582,79200	7,11084
6108	3,78589,90284	7,10967
6109	3,78597,01251	7,10851
6110	3,78604,12102	7,10735
6111	3,78611,22837	7,10619
6112	3,78618,33456	7,10502
6113	3,78625,43958	7,10386
6114	3,78632,54344	7,10270
6115	3,78639,64614	7,10153
6116	3,78646,74767	7,10038
6117	3,78653,84805	7,09921
6118	3,78660,94726	7,09806
6119	3,78668,04532	7,09689
6120	3,78675,14221	7,09574

N.	Logarithmi	Differ.
6121	3,78682,23795	7,09458
6122	3,78689,33253	7,09341
6123	3,78696,42594	7,09226
6124	3,78703,51820	7,09110
6125	3,78710,60930	7,08995
6126	3,78717,69925	7,08878
6127	3,78724,78803	7,08763
6128	3,78731,87566	7,08648
6129	3,78738,96214	7,08531
6130	3,78746,04745	7,08416
6131	3,78753,13161	7,08301
6132	3,78760,21462	7,08185
6133	3,78767,29647	7,08069
6134	3,78774,37716	7,07955
6135	3,78781,45671	7,07838
6136	3,78788,53509	7,07724
6137	3,78795,61233	7,07608
6138	3,78802,68841	7,07493
6139	3,78809,76334	7,07377
6140	3,78816,83711	7,07263
6141	3,78823,90974	7,07147
6142	3,78830,98121	7,07032
6143	3,78838,05153	7,06917
6144	3,78845,12070	7,06802
6145	3,78852,18872	7,06687
6146	3,78859,25559	7,06572
6147	3,78866,32131	7,06457
6148	3,78873,38588	7,06342
6149	3,78880,44930	7,06228
6150	3,78887,51158	7,06112

N.	Logarithmi	Differ.
6151	3,78894,57270	7,05998
6152	3,78901,63268	7,05883
6153	3,78908,69151	7,05768
6154	3,78915,74919	7,05654
6155	3,78922,80573	7,05539
6156	3,78929,86112	7,05424
6157	3,78936,91536	7,05310
6158	3,78943,96846	7,05195
6159	3,78951,02041	7,05081
6160	3,78958,07122	7,04966
6161	3,78965,12088	7,04852
6162	3,78972,16940	7,04737
6163	3,78979,21677	7,04623
6164	3,78986,26300	7,04509
6165	3,78993,30809	7,04395
6166	3,79000,35204	7,04280
6167	3,79007,39484	7,04166
6168	3,79014,43650	7,04052
6169	3,79021,47702	7,03938
6170	3,79028,51640	7,03824
6171	3,79035,55464	7,03710
6172	3,79042,59174	7,03596
6173	3,79049,62770	7,03481
6174	3,79056,66251	7,03368
6175	3,79063,69619	7,03254
6176	3,79070,72873	7,03140
6177	3,79077,76013	7,03027
6178	3,79084,79040	7,02912
6179	3,79091,81952	7,02799
6180	3,79098,84751	7,02685

N.	Logarithmi	Differ.
6181	3,79105,87436	7,02571
6182	3,79112,90007	7,02458
6183	3,79119,92465	7,02344
6184	3,79126,94809	7,02231
6185	3,79133,97040	7,02117
6186	3,79140,99157	7,02003
6187	3,79148,01160	7,01890
6188	3,79155,03050	7,01777
6189	3,79162,04827	7,01663
6190	3,79169,06490	7,01550
6191	3,79176,08040	7,01437
6192	3,79183,09477	7,01323
6193	3,79190,10800	7,01210
6194	3,79197,12010	7,01097
6195	3,79204,13107	7,00984
6196	3,79211,14091	7,09870
6197	3,79218,14961	7,00758
6198	3,79225,15719	7,00645
6199	3,79232,16364	7,00531
6200	3,79239,16895	7,00418
6201	3,79246,17313	7,00306
6202	3,79253,17619	7,00193
6203	3,79260,17812	7,00079
6204	3,79267,17891	6,99967
6205	3,79274,17858	6,99854
6206	3,79281,17712	6,99742
6207	3,79288,17454	6,99629
6208	3,79295,17083	6,99515
6209	3,79302,16598	6,99404
6210	3,79309,16002	6,99290

N.	Logarithmi	Differ.
6211	3,79316,15292	6,99179
6212	3,79323,14471	6,99065
6213	3,79330,13536	6,98953
6214	3,79337,12489	6,98841
6215	3,79344,11330	6,98728
6216	3,79351,10058	6,98616
6217	3,79358,08674	6,98503
6218	3,79365,07177	6,98391
6219	3,79372,05568	6,98279
6220	3,79379,03847	6,98166
6221	3,79386,02013	6,98055
6222	3,79393,00068	6,97942
6223	3,79399,98010	6,97830
6224	3,79406,95840	6,97718
6225	3,79413,93558	6,97605
6226	3,79420,91163	6,97494
6227	3,79427,88657	6,97382
6228	3,79434,86039	6,97270
6229	3,79441,83309	6,97158
6230	3,79448,80467	6,97046
6231	3,79455,77513	6,96934
6232	3,79462,74447	6,96822
6233	3,79469,71269	6,96710
6234	3,79476,67979	6,96599
6235	3,79483,64578	6,96487
6236	3,79490,61065	6,96376
6237	3,79497,57441	6,96263
6238	3,79504,53704	6,96152
6239	3,79511,49856	6,96041
6240	3,79518,45897	6,95929

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
6241	3,79525,41826	6,95817	6271	3,79733,68008	6,92489
6242	3,79532,37643	6,95706	6272	3,79740,60497	6,92378
6243	3,79539,33349	6,95595	6273	3,79747,52875	6,92269
6244	3,79546,28944	6,95483	6274	3,79754,45144	6,92158
6245	3,79553,24427	6,95372	6275	3,79761,37302	6,92047
6246	3,79560,19799	6,95260	6276	3,79768,29349	6,91938
6247	3,79567,15059	6,95150	6277	3,79775,21287	6,91827
6248	3,79574,10209	6,95038	6278	3,79782,13114	6,91717
6249	3,79581,05247	6,94926	6279	3,79789,04831	6,91606
6250	3,79588,00173	6,94816	6280	3,79795,96437	6,91497
6251	3,79594,94989	6,94704	6281	3,79802,87934	6,91387
6252	3,79601,89693	6,94594	6282	3,79809,79321	6,91276
6253	3,79608,84287	6,94482	6283	3,79816,70597	6,91167
6254	3,79615,78769	6,94371	6284	3,79823,61764	6,91056
6255	3,79622,73140	6,94261	6285	3,79830,52820	6,90947
6256	3,79629,67401	6,94149	6286	3,79837,43767	6,90837
6257	3,79636,61550	6,94038	6287	3,79844,34604	6,90726
6258	3,79643,55588	6,93928	6288	3,79851,25330	6,90617
6259	3,79650,49516	6,93816	6289	3,79858,15947	6,90507
6260	3,79657,43332	6,93706	6290	3,79865,06454	6,90398
6261	3,79664,37038	6,93595	6291	3,79871,96852	6,90288
6262	3,79671,30633	6,93484	6292	3,79878,87140	6,90177
6263	3,79678,24117	6,93373	6293	3,79885,77317	6,90069
6264	3,79685,17490	6,93263	6294	3,79892,67386	6,89958
6265	3,79692,10753	6,93152	6295	3,79899,57344	6,89850
6266	3,79699,03905	6,93042	6296	3,79906,47194	6,89739
6267	3,79705,96947	6,92931	6297	3,79913,36933	6,89630
6268	3,79712,89878	6,92820	6298	3,79920,26563	6,89520
6269	3,79719,82698	6,92710	6299	3,79927,16083	6,39412
6270	3,79726,75408	6,92600	6300	3,79934,05495	6,89301

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
6301	3,79940,94796	6,89192	6331	3,80147,23135	6,85927
6302	3,79947,83988	6,89083	6332	3,80154,09062	6,85818
6303	3,79954,73071	6,88974	6333	3,80160,94880	6,85710
6304	3,79961,62045	6,88864	6334	3,80167,80590	6,85602
6305	3,79968,50909	6,88755	6335	3,80174,66192	6,85494
6306	3,79975,39664	6,88646	6336	3,80181,51686	6,85385
6307	3,79982,28310	6,88537	6337	3,80188,37071	6,85278
6308	3,79989,16847	6,88427	6338	3,80195,22349	6,85169
6309	3,79996,05274	6,88318	6339	3,80202,07518	6,85061
6310	3,80002,93592	6,88210	6340	3,80208,92579	6,84953
6311	3,80009,81802	6,88100	6341	3,80215,77532	6,84845
6312	3,80016,69902	6,87991	6342	3,80222,62377	6,84737
6313	3,80023,57893	6,87883	6343	3,80229,47114	6,84629
6314	3,80030,45776	6,87773	6344	3,80236,31743	6,84521
6315	3,80037,33549	6,87664	6345	3,80243,16264	6,84414
6316	3,80044,21213	6,87556	6346	3,80250,00678	6,64305
6317	3,80051,08769	6,87447	6347	3,80256,84983	6,84198
6318	3,80057,96216	6,87338	6348	3,80263,69181	6,84090
6319	3,80064,83554	6,87229	6349	3,80270,53271	6,83982
6320	3,80071,70783	6,87120	6350	3,80277,37253	6,83874
6321	3,80078,57903	6,87012	6351	3,80284,21127	6,83767
6322	3,80085,44915	6,86903	6352	3,80291,04894	6,83659
6323	3,80092,31818	6,86795	6353	3,80297,88553	6,83552
6324	3,80099,18613	6,86685	6354	3,80304,72105	6,83444
6325	3,80106,05298	6,86578	6355	3,80311,55549	6,83336
6326	3,80112,91876	6,86469	6356	3,80318,38885	6,83229
6327	3,80119,78345	6,86360	6357	3,80325,22114	6,83122
6328	3,80126,64705	6,86252	6358	3,80332,05236	6,83014
6329	3,80133,50957	6,86143	6359	3,80338,88250	6,82906
6330	3,80140,37100	6,86035	6360	3,80345,71156	6,82800

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
6361	3,80352,53956	6,82692	6391	3,80556,88175	6,79488
6362	3,80359,36648	6,82584	6392	3,80563,67663	6,79381
6363	3,80366,19232	6,82478	6393	3,80570,47044	6,79275
6364	3,80373,01710	6,82370	6394	3,80577,26319	6,79169
6365	3,80379,84080	6,82263	6395	3,80584,05488	6,79063
6366	3,80386,66343	6,82156	6396	3,80590,84551	6,78956
6367	3,80393,48499	6,82048	6397	3,80597,63507	6,78850
6368	3,80400,30547	6,81942	6398	3,80604,42357	6,78745
6369	3,80407,12489	6,81834	6399	3,80611,21102	6,78638
6370	3,80413,94323	6,81728	6400	3,80617,99740	6,78532
6371	3,80420,76051	6,81620	6401	3,80624,78272	6,78426
6372	3,80427,57671	6,81514	6402	3,80631,56698	6,78320
6373	3,80434,39185	6,81406	6403	3,80638,35018	6,78214
6374	3,80441,20591	6,81300	6404	3,80645,13232	6,78109
6375	3,80448,01891	6,81193	6405	3,80651,91341	6,78002
6376	3,80454,83084	6,81086	6406	3,80658,69343	6,77897
6377	3,80461,64170	6,80979	6407	3,80665,47240	6,77791
6378	3,80468,45149	6,80873	6408	3,80672,25031	6,77685
6379	3,80475,26022	6,80765	6409	3,80679,02716	6,77579
6380	3,80482,06787	6,80659	6410	3,80685,80295	6,77474
6381	3,80488,87446	6,80553	6411	3,80692,57769	6,77368
6382	3,80495,67999	6,80445	6412	3,80699,35137	6,77262
6383	3,80502,48444	6,80339	6413	3,80706,12399	6,77157
6384	3,80509,28783	6,80233	6414	3,80712,89556	6,77051
6385	3,80516,09016	6,80126	6415	3,80719,66607	6,76946
6386	3,80522,89142	6,80020	6416	3,80726,43553	6,76840
6387	3,80529,69162	6,79913	6417	3,80733,20393	6,76735
6388	3,80536,49075	6,79806	6418	3,80739,97128	6,76629
6389	3,80543,28881	6,79701	6419	3,80746,73757	6,76524
6390	3,80550,08582	6,79593	6420	3,80753,50281	6,76418

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
6421	3,80760,26699	6,76313	6451	3,80962,70419	6,73168
6422	3,80767,03012	6,76208	6452	3,80969,43587	6,73064
6423	3,80773,79220	6,76103	6453	3,80976,16651	6,72960
6424	3,80780,55323	6,75997	6454	3,80982,89611	6,72855
6425	3,80787,31320	6,75892	6455	3,80989,62466	6,72751
6426	3,80794,07212	6,75787	6456	3,80996,35217	6,72647
6427	3,80800,82999	6,75682	6457	3,81003,07864	6,72543
6428	3,80807,58681	6,75577	6458	3,81009,80407	6,72438
6429	3,80814,34258	6,75471	6459	3,81016,52845	6,72335
6430	3,80821,09729	6,75367	6460	3,81023,25180	6,72230
6431	3,80827,85096	6,75261	6461	3,81029,97410	6,72127
6432	3,80834,60357	6,75157	6462	3,81036,69537	6,72022
6433	3,80841,35514	6,75052	6463	3,81043,41559	6,71919
6434	3,80848,10566	6,74946	6464	3,81050,13478	6,71814
6435	3,80854,85512	6,74842	6465	3,81056,85292	6,71711
6436	3,80861,60354	6,74737	6466	3,81063,57003	6,71606
6437	3,80868,35091	6,74632	6467	3,81070,28609	6,71503
6438	3,80875,09723	6,74528	6468	3,81077,00112	6,71399
6439	3,80881,84251	6,74423	6469	3,81083,71511	6,71296
6440	3,80888,58674	6,74318	6470	3,81090,42807	6,71191
6441	3,80895,32992	6,74213	6471	3,81097,13998	6,71088
6442	3,80902,07205	6,74108	6472	3,81103,85086	6,70984
6443	3,80908,81313	6,74004	6473	3,81110,56070	6,70881
6444	3,80915,55317	6,73900	6474	3,81117,26951	6,70777
6435	3,80922,29217	6,73795	6475	3,81123,97728	6,70673
6446	3,80929,03012	6,73690	6476	3,81130,68401	6,70570
6447	3,80935,76702	6,73586	6477	3,81137,38971	6,70466
6448	3,80942,50288	6,73481	6478	3,81144,09437	6,70362
6449	3,80949,23769	6,73377	6479	3,81150,79799	6,70260
6450	3,80955,97146	6,73273	6480	3,81157,50059	6,70156

N.	Logarithmi	Differ.
6481	3,81164,20215	6,70052
6482	3,81170,90267	6,69949
6483	3,81177,60216	6,69846
6484	3,81184,30062	6,69742
6485	3,81190,99804	6,69639
6486	3,81197,69443	6,69536
6487	3,81204,38979	6,69433
6488	3,81211,08412	6,69330
6489	3,81217,77742	6,69226
6490	3,81224,46968	6,69123
6491	3,81231,16091	6,69021
6492	3,81237,85112	6,68917
6493	3,81244,54029	6,68814
6494	3.81251,22843	6,68711
6495	3,81257,91554	6,68608
6496	3,81264,60162	6,68506
6497	3,81271,28668	6,68402
6498	3,81277,97070	6,68300
6499	3,81284,65370	6,68196
6500	3,81291,33566	6,68094
6501	3,81298,01660	6,67992
6502	3,81304,69652	6,67888
6503	3,81311,37540	6,67786
6504	3,81318,05326	6,67683
6505	3,81324,73009	6,67580
6506	3,81331,40589	6,67478
6507	3,81338,08067	6,67376
6508	3,81344,75443	6,67272
6509	3,81351,42715	6,67171
6510	3,81358,09886	6,67067
6511	3,81364,76953	6,66966
6512	3,81371,43919	6,66863
6513	3,81378,10782	6,66760
6514	3,81384,77542	6,66658
6515	3,81391,44200	6,66556
6516	3,81398,10756	6,66454
6517	3,81404,77210	6,66351
6518	3,81411,43561	6,66249
6519	3,81418,09810	6,66147
6520	3,81424,75957	6,66045
6521	3,81431,42002	6,65943
6522	3,81438,07945	6,65840
6523	3,81444,73785	6,65739
6524	3,81451,39524	6,65636
6525	3,81458,05160	6,65535
6526	3,81464,70695	6,65432
6527	3,81471,36127	6,65330
6528	3,81478,01457	6,65229
6529	3,81484,66686	6,65127
6530	3,81491,31813	6,65025
6531	3,81497,96838	6,64923
6532	3,81504,61761	6,64821
6533	3,81511,26582	6,64719
6534	3,81517,91301	6,64618
6535	3,81524,55919	6,64516
6536	3,81531,20435	6,64415
6537	3,81537,84850	6,64312
6538	3,81544,49162	6,64212
6539	3,81551,13374	6,64109
6540	3,81557,77483	6,64008

N.	Logarithmi	Differ.
6541	3,81564,41491	6,63907
6542	3,81571,05398	6,63805
6543	3,81577,69203	6,63704
6544	3,81584,32907	6,63602
6545	3,81590,96509	6,63501
6546	3,81597,60010	6,63399
6547	3,81604,23409	6,63298
6548	3,81610,86707	6,63197
6549	3,81617,49904	6,63096
6550	3,81624,13000	6,62994
6551	3,81630,75994	6,62894
6552	3,81637,38888	6,62792
6553	3,81644,01680	6,62690
6554	3,81650,64370	6,62590
6555	3,81657,26960	6,62489
6556	3,81663,89449	6,62388
6557	3,81670,51837	6,62286
6558	3,81677,14123	6,62186
6559	3,81683,76309	6,62085
6560	3,81690,38394	6,61984
6561	3,81697,00378	6,61883
6562	3,81703,62261	6,61782
6563	3,81710,24043	6,61681
6564	3,81716,85724	6,61580
6565	3,81723,47304	6,61480
6566	3,81730,08784	6,61379
6567	3,81736,70163	6,61278
6568	3,81743,31441	6,61178
6569	3,81749,92619	6,61077
6570	3,81756,53696	6,60976

N.	Logarithmi	Differ.
6571	3,81763,14672	6,60876
6572	3,81769,75548	6,60775
6573	3,81776,36323	6,60674
6574	3,81782,96997	6,60575
6575	3,81789,57572	6,60473
6576	3,81796,18045	6,60374
6577	3,81802,78419	6,60272
6578	3,81809,38691	6,60173
6579	3,81815,98864	6,60072
6580	3,81822,58936	6,59972
6581	3,81829,18908	6,59872
6582	3,81835,78780	6,59771
6583	3,81842,38551	6,59671
6584	3,81848,98222	6,59571
6585	3,81855,57793	6,59471
6586	3,81862,17264	6,59370
6587	3,81868,76634	6,59271
6588	3,81875,35905	6,59170
6589	3,81881,95075	6,59071
6590	3,81888,54146	6,58970
6591	3,81895,13116	6,58871
6592	3,81901,71987	6,58770
6593	3,81908,30757	6,58671
6594	3,81914,89428	6,58571
6595	3,81921,47999	6,58471
6596	3,81928,06470	6,58371
6597	3,81934,64841	6,58271
6598	3,81941,23112	6,58172
6599	3,81947,81284	6,58071
6600	3,81954,39355	6,57973

N.	Logarithmi	Differ.
6601	3,81960,97328	6,57872
6602	3,81967,55200	6,57773
6603	3,81974,12973	6,57673
6604	3,81980,70646	6,57574
6605	3,81987,28220	6,57474
6606	3,81993,85694	6,57374
6607	3,82000,43068	6,57275
6608	3,82007,00343	6,57176
6609	3,82013,57519	6,57076
6610	3,82020,14595	6,56977
6611	3,82026,71572	6,56877
6612	3,82033,28449	6,56778
6613	3,82039,85227	6,56679
6614	3,82046,41906	6,56579
6615	3,82052,98485	6,56480
6616	3,82059,54965	6,56381
6617	3,82066,11346	6,56282
6618	3,82072,67628	6,56183
6619	3,82079,23811	6,56083
6620	3,82085,79894	6,55985
6621	3,82092,35879	6,55885
6622	3,82098,91764	6,55786
6623	3,82105,47550	6,55688
6624	3,82112,03238	6,55588
6625	3,82118,58826	6,55489
6626	3,82125,14315	6,55391
6627	3,82131,69706	6,55291
6628	3,82138,24997	6,55193
6629	3,82144,80190	6,55094
6630	3,82151,35284	6,54995
6631	3,82157,90279	6,54896
6632	3,82164,45175	6,54798
6633	3,82170,99973	6,54699
6634	3,82177,54672	6,54600
6635	3,82184,09272	6,54502
6636	3,82190,63774	6,54402
6637	3,82197,18176	6,54305
6638	3,82203,72481	6,54205
6639	3,82210,26686	6,54108
6640	3,82216,80794	6,54008
6641	3,82223,34802	6,53911
6642	3,82229,88713	6,53811
6643	3,82236,42524	6,53714
6644	3,82242,96238	6,53615
6645	3,82249,49853	6,53516
6646	3,82256,03369	6,53419
6647	3,82262,56788	6,53320
6648	3,82269,10108	6,53222
6649	3,82275,63330	6,53123
6650	3,82282,16453	6,53025
6651	3,82288,69478	6,52927
6652	3,82295,22405	6,52829
6653	3,82301,75234	6,52731
6654	3,82308,27965	6,52633
6655	3,82314,80598	6,52535
6656	3,82321,33133	6,52437
6657	3,82327,85570	6,52338
6658	3,82334,37908	6,52241
6659	3,82340,90149	6,52143
6660	3,82347,42292	6,52045

N.	Logarithmi	Differ.
6661	3,82353,94337	6,51947
6662	3,82360,46284	6,51849
6663	3,82366,98133	6,51751
6664	3,82373,49884	6,51653
6665	3,82380,01537	6,51556
6666	3,82386,53093	6,51458
6667	3,82393,04551	6,51361
6668	3,82399,55912	6,51262
6669	3,82406,07174	6,51165
6670	3,82412,58339	6,51068
6671	3,82419,09407	6,50969
6672	3,82425,60376	6,50873
6673	3,82432,11249	6,50774
6674	3,82438,62023	6,50677
6675	3,82445,12700	6,50580
6676	3,82451,63280	6,50482
6677	3,82458,13762	6,50385
6678	3,82464,64147	6,50288
6679	3,82471,14435	6,50190
6680	3,82477,64625	6,50093
6681	3,82484,14718	6,49995
6682	3,82490,64713	6,49898
6683	3,82497,14611	6,49801
6684	3,82503,64412	6,49704
6685	3,82510,14116	6,49607
6686	3,82516,63723	6,49509
6687	3,82523,13232	6,49412
6688	3,82529,62644	6,49316
6689	3,82536,11960	6,49218
6690	3,82542,61178	6,49121
6691	3,82549,10299	6,49024
6692	3,82555,59323	6,48927
6693	3,82562,08250	6,48830
6694	3,82568,57080	6,48733
6695	3,82575,05813	6,48637
6696	3,82581,54450	6,48539
6697	3,82588,02989	6,48443
6698	3,82594,51432	6,48346
6699	3,82600,99778	6,48249
6700	3,82607,48027	6,48152
6701	3,82613,96179	6,48056
6702	3,82620,44235	6,47959
6703	3,82626,92194	6,47862
6704	3,82633,40056	6,47766
6705	3,82639,87822	6,47669
6706	3,82646,35491	6,47572
6707	3,82652,83063	6,47476
6708	3,82659,30539	6,47380
6709	3,82665,77919	6,47283
6710	3,82672,25202	6,47186
6711	3,82678,72388	6,47090
6712	3,82685,19478	6,46994
6713	3,82691,66472	6,46897
6714	3,82698,13369	6,46801
6715	3,82704,60170	6,46705
6716	3,82711,06875	6,46608
6717	3,82717,53483	6,46512
6718	3,82723,99995	6,46416
6719	3,82730,46411	6,46320
6720	3,82736,92731	6,46224

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
6721	3,82743,38954	6,46127	6751	3,82936,81080	6,43256
6722	3,82749,85081	6,46032	6752	3,82943,24336	6,43161
6723	3,82756,31113	6,45935	6753	3,82949,67497	6,43066
6724	3,82762,77048	6,45839	6754	3,82956,10563	6,42971
6725	3,82769,22887	6,45743	6755	3,82962,53534	6,42875
6726	3,82775,68630	6,45647	6756	3,82968,96409	6,42780
6727	3,82782,14277	6,45551	6757	3,82975,39189	6,42685
6728	3,82788,59828	6,45455	6758	3,82981,81874	6,42590
6729	3,82795,05283	6,45359	6759	3,82988,24464	6,42495
6730	3,82801,50642	6,45264	6760	3,82994,66959	6,42400
6731	3,82807,95906	6,45167	6761	3,83001,09359	6,42305
6732	3,82814,41073	6,45072	6762	3,83007,51664	6,42210
6733	3,82820,86145	6,44976	6763	3,83013,93874	6,42115
6734	3,82827,31121	6,44880	6764	3,83020,35989	6,42020
6735	3,82833,76001	6,44784	6765	3,83026,78009	6,41926
6736	3,82840,20785	6,44689	6766	3,83033,19935	6,41830
6737	3,82846,65474	6,44592	6767	3,83039,61765	6,41735
6738	3,82853,10066	6,44498	6768	3,83046,03500	6,41641
6739	3,82859,54564	6,44401	6769	3,83052,45141	6,41546
6740	3,82865,68965	6,44306	6770	3,83058,86687	6,41451
6741	3,82872,43271	6,44211	6771	3,83065,28138	6,41356
6742	3,82878,87482	6,44115	6772	3,83071,69494	6,41262
6743	3,82885,31597	6,44019	6773	3,83078,10756	6,41167
6744	3,82891,75616	6,43924	6774	3,83084,51923	6,41072
6745	3,82898,19540	6,43829	6775	3,83090,92995	6,40978
6746	3,82904,63369	6,43733	6776	3,83097,33973	6,40883
6747	3,82911,07102	6,43637	6777	3,83103,74856	6,40789
6748	3,82917,50739	6,43542	6778	3,83110,15645	6,40694
6749	3,82923,94281	6,43447	6779	3,83116,56339	6,40600
6750	3,82930,37728	6,43352	6780	3,83122,96939	6,40505

6780			6810		
N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
6781	3,83129,37444	6,40410	6811	3,83321,08803	6,37590
6782	3,83135,77854	6,40317	6812	3,83327,46393	6,37496
6783	3,83142,18171	6,40221	6813	3,83333,83889	6,37403
6784	3,83148,58392	6,40128	6814	3,83340,21292	6,37310
6785	3,83154,98520	6,40033	6815	3,83346,58602	6,37216
6786	3,83161,38553	6,39939	6816	3,83352,95818	6,37122
6787	3,83167,78492	6,39844	6817	3,83359,32940	6,37029
6788	3,83174,18336	6,39751	6818	3,83365,69969	6,36935
6789	3,83180,58087	6,39656	6819	3,83372,06904	6,36843
6790	3,83186,97743	6,39562	6820	3,83378,43747	6,36748
6791	3,83193,37305	6,39467	6821	3,83384,80495	6,36656
6792	3,83199,76772	6,39374	6822	3,83391,17151	6,36562
6793	3,83206,16146	6,39279	6823	3,83397,53713	6,36469
6794	3,83212,55425	6,39186	6824	3,83403,90182	6,36375
6795	3,83218,94611	6,39091	6825	3,83410,26557	6,36282
6796	3,83225,33702	6,38997	6826	3,83416,62839	6,36190
6797	3,83231,72699	6,38903	6827	3,83422,99029	6,36095
6798	3,83238,11602	6,38810	6828	3,83429,35124	6,36003
6799	3,83244,50412	6,38715	6829	3,83435,71127	6,35910
6800	3,83250,89127	6,38621	6830	3,83442,07037	6,35816
6801	3,83257,27748	6,38528	6831	3,83448,42853	6,35724
6802	3,83263,66276	6,38434	6832	3,83454,78577	6,35630
6803	3,83270,04710	6,38339	6833	3,83461,14207	6,35538
6804	3,83276,43049	6,38246	6834	3,83467,49745	6,35444
6805	3,83282,81295	6,38153	6835	3,83473,85189	6,35351
6806	3,83289,19448	6,38058	6836	3,83480,20540	6,35259
6807	3,83295,57506	6,37965	6837	3,83486,55799	6,35166
6808	3,83301,95471	6,37871	6838	3,83492,90965	6,35072
6809	3,83308,33342	6,37777	6839	3,83499,26037	6,34980
6810	3,83314,71119	6,37684	6840	3,83505,61017	6,34887

N.	Logarithmi	Differ.
6841	3,83511,95904	6,34794
6842	3,83518,30698	6,34702
6843	3,83524,65400	6,34609
6844	3,83531,00009	6,34516
6845	3,83537,34525	6,34423
6846	3,83543,68948	6,34331
6847	3,83550,03279	6,34238
6848	3,83556,37517	6,34145
6849	3,83562,71662	6,34053
6850	3,83569,05715	6,33960
6851	3,83575,39675	6,33868
6852	3,83581,73543	6,33775
6853	3,83588,07318	6,33683
6854	3,83594,41001	6,33590
6855	3,83600,74591	6,33498
6856	3,83607,08089	6,33406
6857	3,83613,41495	6,33313
6858	3,83619,74808	6,33221
6859	3,83626,08029	6,33128
6860	3,83632,41157	6,33036
6861	3,83638,74193	6,32944
6862	3,83645,07137	6,32852
6863	3,83651,39989	6,32759
6864	3,83657,72748	6,32668
6865	3,83664,05416	6,32575
6866	3,83670,37991	6,32483
6867	3,83676,70474	6,32391
6868	3,83683,02865	6,32299
6869	3,83689,35164	6,32207
6870	3,83695,67371	6,32114

N.	Logarithmi	Differ.
6871	3,83701,99485	6,32023
6872	3,83708,31508	6,31931
6873	3,83714,63439	6,31839
6874	3,83720,95278	6,31747
6875	3,83727,27025	6,31655
6876	3,83733,58680	6,31563
6877	3,83739,90243	6,31472
6878	3,83746,21715	6,31379
6879	3,83752,53094	6,31288
6880	3,83758,84382	6,31196
6881	3,83765,15578	6,31105
6882	3,83771,46683	6,31013
6883	3,83777,77696	6,30921
6884	3,83784,08617	6,30829
6885	3,83790,39446	6,30738
6886	3,83796,70184	6,30646
6887	3,83803,00830	6,30554
6888	3,83809,31384	6,30464
6889	3,83815,61848	6,30371
6890	3,83821,92219	6,30280
6891	3,83828,22499	6,30189
6892	3,83834,52688	6,30097
6893	3,83840,82785	6,30006
6894	3,83847,12791	6,29914
6895	3,83853,42705	6,29823
6896	3,83859,72528	6,29732
6897	3,83866,02260	6,29640
6898	3,83872,31900	6,29549
6899	3,83878,61449	6,29458
6900	3,83884,90907	6,29367

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
6901	3,83891,20274	6,29276	6931	3,84079,58988	6,26552
6902	3,83897,49550	6,29184	6932	3,84085,85540	6,26462
6903	3,83903,78734	6,29093	6933	3,84092,12002	6,26371
6904	3,83910,07827	6,29002	6934	3,84098,38373	6,26281
6905	3,83916,36829	6,28911	6935	3,84104,64654	6,26191
6906	3,83922,65740	6,28820	6936	3,84110,90845	6,26100
6907	3,83928,94560	6,28729	6937	3,84117,16945	6,26010
6908	3,83935,23289	6,28638	6938	3,84123,42955	6,25920
6909	3,83941,51927	6,28547	6939	3,84129,68875	6,25830
6910	3,83947,80474	6,28456	6940	3,84135,94705	6,25739
6911	3,83954,08930	6,28365	6941	3,84142,30444	6,25649
6912	3,83960,37295	6,28274	6942	3,84148,46093	6,25560
6913	3,83966,65569	6,28183	6943	3,84154,71653	6,25469
6914	3,83972,93752	6,28092	6944	3,84160,97122	6,25379
6915	3,83979,21844	6,28002	6945	3,84167,22501	6,25289
6916	3,83985,49846	6,27911	6946	3,84173,47790	6,25199
6917	3,83991,77757	6,27820	6947	3,84179,72989	6,25109
6918	3,83998,05577	6,27729	6948	3,84185,98098	6,25019
6919	3,84004,33306	6,27639	6949	3,84192,23117	6,24929
6920	3,84010,60945	6,27547	6950	3,84198,48046	6,24839
6921	3,84016,88492	6,27458	6951	3,84204,72885	6,24749
6922	3,84023,15950	6,27366	6952	3,84210,97634	6,24660
6923	3,84029,43316	6,27276	6953	3,84217,22294	6,24569
6924	3,84035,70592	6,27185	6954	3,84223,46863	6,24480
6925	3,84041,97777	6,27095	6955	3,84229,71343	6,24390
6926	3,84048,24872	6,27004	6956	3,84235,95733	6,24301
6927	3,84054,51876	6,26914	6957	3,84242,20034	6,24210
6928	3,84060,78790	6,26823	6958	3,84248,44244	6,24121
6929	3,84067,05613	6,26733	6959	3,84254,68365	6,24031
6930	3,84073,32346	6,26642	6960	3,84260,92396	6,23942

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
6961	3,84267,16338	6,23851	6991	3,84453,93021	6,21175
6962	3,84273,40189	6,23763	6992	3,84460,14196	6,21086
6963	3,84279,63952	6,23672	6993	3,84466,35282	6,20998
6964	3,84285,87624	6,23584	6994	3,84472,56280	6,20908
6965	3,84292,11208	6,23493	6995	3,84478,77188	6,20820
6966	3,84298,34701	6,23404	6996	3,84484,98008	6,20731
6967	3,84304,58105	6,23315	6997	3,84491,18739	6,20642
6968	3,84310,81420	6,23225	6998	3,84497,39381	6,20554
6969	3,84317,04645	6,23136	6999	3,84503,59935	6,20465
6970	3,84323,27781	6,23046	7000	3,84509,80400	6,20377
6971	3,84329,50827	6,22957	7001	3,84516,00777	6,20287
6972	3,84335,73784	6,22868	7002	3,84522,21064	6,20199
6973	3,84341,96652	6,22778	7003	3,84528,41263	6,20111
6974	3,84348,19430	6,22689	7004	3,84534,61374	6,20022
6975	3,84354,42119	6,22600	7005	3,84540,81396	6,19934
6976	3,84360,64719	6,22511	7006	3,84547,01330	6,19845
6977	3,84366,87230	6,22421	7007	3,84553,21175	6,19757
6978	3,84373,09651	6,22332	7008	3,84559,40932	6,19668
6979	3,84379,31983	6,22243	7009	3,84565,60600	6,19580
6980	3,84385,54226	6,22154	7010	3,84571,80180	6,19491
6981	3,84391,76380	6,22065	7011	3,84577,99671	6,19403
6982	3,84397,98445	6,21975	7012	3,84584,19074	6,19315
6983	3,84404,20420	6,21887	7013	3,84590,38389	6,19226
6984	3,84410,42307	6,21798	7014	3,84596,57615	6,19139
6985	3,84416,64105	6,21708	7015	3,84602,76754	6,19050
6986	3,84422,85813	6,21620	7016	3,84608,95804	6,18961
6987	3,84429,07433	6,21530	7017	3,84615,14765	6,18874
6988	3,84435,28963	6,21442	7018	3,84621,33639	6,18785
6989	3,84441,50405	6,21352	7019	3,84627,52424	6,18697
6990	3,84447,71757	6,21264	7020	3,84633,71121	6,18609

N.	Logarithmi	Differ.
7021	3,84639,89730	6,18521
7022	3,84646,08251	6,18433
7023	3,84652,26684	6,18345
7024	3,84658,45029	6,18257
7025	3,84664,63286	6,18169
7026	3,84670,81455	6,18080
7027	3,84676,99535	6,17993
7028	3,84683,17528	6,17905
7029	3,84689,35433	6,17817
7030	3,84695,53250	6,17729
7031	3,84701,70979	6,17642
7032	3,84707,88621	6,17553
7033	3,84714.06174	6,17466
7034	3,84720,23640	6,17378
7035	3,84726,41018	6,17290
7036	3,84732,58308	6,17202
7037	3,84738,75510	6,17115
7038	3,84744,92625	6,17027
7039	3,84751,09652	6,16939
7040	3,84757,26591	6,16852
7041	3,84763,43443	6,16764
7042	3,84769,60207	6,16677
7043	3,84775,76884	6,16589
7044	3,84781,93473	6,16501
7045	3,84788,09974	6,16414
7046	3,84794,26388	6,16327
7047	3,84800,42715	6,16239
7048	3,84806,58954	6,16152
7049	3,84812,75106	6,16064
7050	3,84818,91170	6,15977

N.	Logarithmi	Differ.
7051	3,84825,07147	6,15889
7052	3,84831,23036	6,15802
7053	3,84837,38838	6,15715
7054	3,84843,54553	6,15628
7055	3,84849,70181	6,15540
7056	3,84855,85721	6,15453
7057	3,84862,01174	6,15366
7058	3,84868,16540	6,15279
7059	3,84874,31819	6,15192
7060	3,84880,47011	6,15104
7061	3,84886,62115	6,15017
7062	3,84892,77132	6,14931
7063	3,84898,92063	6,14843
7064	3,84905,06906	6,14756
7065	3,84911,21662	6,14669
7066	3,84917,36331	6,14582
7067	3,84923,50913	6,14495
7068	3,84929,65408	6,14409
7069	3,84935,79817	6,14321
7070	3,84941,94138	6,14234
7071	3,84948,08372	6,14148
7072	3,84954,22520	6,14061
7073	3,84960,36581	6,13974
7074	3,84966,50555	6,13887
7075	3,84972,64442	6,13800
7076	3,84978,78242	6,13714
7077	3,84984,91956	6,13627
7078	3,84991,05583	6,13540
7079	3,84997,19123	6,13454
7080	3,85003,32577	6,13367

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
7081	3,85009,45944	6,13280	7111	3,85193,06786	6,10694
7082	3,85015,59224	6,13194	7112	3,85199,17480	6,10607
7083	3,85021,72418	6,13107	7113	3,85205,28087	6,10521
7084	3,85027,85525	6,13021	7114	3,85211,38608	6,10436
7085	3,85033,98546	6,12934	7115	3,85217,49044	6,10350
7086	3,85040,11480	6,12848	7116	3,85223,59394	6,10264
7087	3,85046,24328	6,12761	7117	3,85229,69658	6,10169
7088	3,85052,37089	6,12675	7118	3,85235,79837	6,10092
7089	3,85058,49764	6,12588	7119	3,85241,89929	6,10007
7090	3,85064,62352	6,12502	7120	3,85247,99936	6,09922
7091	3,85070,74854	6,12415	7121	3,85254,09858	6,09835
7092	3,85076,87269	6,12329	7122	3,85260,19693	6,09750
7093	3,85082,99598	6,12243	7123	3,85266,29443	6,09665
7094	3,85089,11841	6,12157	7124	3,85272,39108	6,09579
7095	3,85095,23998	6,12070	7125	3,85278,48687	6,09493
7096	3,85101,36068	6,11984	7126	3,85284,58180	6,09408
7097	3,85107,48052	6,11898	7127	3,85290,67588	6,09322
7098	3,85113,59950	6,11812	7128	3,85296,76910	6,09237
7099	3,85119,71762	6,11725	7129	3,85302,86147	6,09152
7100	3,85125,83487	6,11639	7130	3,85308,95299	6,09065
7101	3,85131,95126	6,11554	7131	3,85315,04364	6,08981
7102	3,85138,06680	6,11467	7132	3,85321,13345	6,08895
7103	3,85144,18147	6,11381	7133	3,85327,22240	6,08810
7104	3,85150,29528	6,11295	7134	3,85333,31050	6,08725
7105	3,85156,40823	6,11209	7135	3,85339,39775	6,08639
7106	3,85162,52032	6,11122	7136	3,85345,48414	6,08554
7107	3,85168,63154	6,11037	7137	3,85351,56968	6,08468
7108	3,85174,74191	6,10951	7138	3,85357,65436	6,08384
7109	3,85180,85142	6,10865	7139	3,85363,73820	6,08298
7110	3,85186,96007	6,10779	7140	3,85369,82118	6,08213

N.	Logarithmi	Differ.
7141	3,85375,90331	6,08128
7142	3,85381,98459	6,08042
7143	3,85388,06501	6,07958
7144	3,85394,14459	6,07872
7145	3,85400,22331	6,07788
7146	3,85406,30119	6,07702
7147	3,85412,37821	6,07617
7148	3,85418,45438	6,07533
7149	3,85424,52971	6,07447
7150	3,85430,60418	6,07362
7151	3,85436,67780	6,07278
7152	3,85442,75058	6,07192
7153	3,85448,82250	6,07108
7154	3,85454,89358	6,07023
7155	3,85460,96381	6,06938
7156	3,85467,03319	6,06853
7157	3,85473,10172	6,06769
7158	3,85479,16941	6,06683
7159	3,85485,23624	6,06599
7160	3,85491,30223	6,06514
7161	3,85497,36737	6,06430
7162	3,85503,43167	6,06345
7163	3,85509,49512	6,06260
7164	3,85515,55772	6,06175
7165	3,85521,61947	6,06091
7166	3,85527,68038	6,06007
7167	3,85533,74045	6,05922
7168	3,85539,79967	6,05837
7169	3,85545,85804	6,05753
7170	3,85551,91557	6,05668

N.	Logarithmi	Differ.
7171	3,85557,97225	6,05584
7172	3,85564,02809	6,05499
7173	3,85570,08308	6,05415
7174	3,85576,13723	6,05331
7175	3,85582,19054	6,05246
7176	3,85588,24300	6,05162
7177	3,85594,29462	6,05078
7178	3,85600,34540	6,04993
7179	3,85606,39533	6,04909
7180	3,85612,44442	6,04825
7181	3,85618,49267	6,04741
7182	3,85624,54008	6,04656
7183	3,85630,58664	6,04573
7184	3,85636,63237	6,04488
7185	3,85642,67725	6,04404
7186	3,85648,72129	6,04320
7187	3,85654,76449	6,04235
7188	3,85660,80684	6,04152
7189	3,85666,84836	6,04068
7190	3,85672,88904	6,03984
7191	3,85678,92888	6,03899
7192	3,85684,96787	6,03816
7193	3,85691,00603	6,03732
7194	3,85697,04335	6,03648
7195	3,85703,07983	6,03564
7196	3,85709,11547	6,03480
7197	3,85715,15027	6,03396
7198	3,85721,18423	6,03313
7199	3,85727,21736	6,03228
7200	3,85733,24964	6,03145

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
7201	3,85739,28109	6,03061	7231	3,85919,83615	6,00560
7202	3,85745,31170	6,02978	7232	3,85925,84175	6,00476
7203	3,85751,34148	6,02893	7233	3,85931,84651	6,00393
7204	3,85757,37041	6,02811	7234	3,85937,85044	6,00311
7205	3,85763,39852	6,02726	7235	3,85943,85355	6,00227
7206	3,85769,42578	6,02643	7236	3,85949,85582	6,00144
7207	3,85775,45221	6,02559	7237	3,85955,85726	6,00062
7208	3,85781,47780	6,02475	7238	3,85961,85788	5,99978
7209	3,85787,50255	6,02392	7239	3,85967,85766	5,99896
7210	3,85793,52647	6,02309	7240	3,85973,85662	5,99813
7211	3,85799,54956	6,02225	7241	3,85979,85475	5,99730
7212	3,85805,57181	6,02141	7242	3,85985,85205	5,99647
7213	3,85811,59322	6,02058	7243	3,85991,84852	5,99564
7214	3,85817,61380	6,01974	7244	3,85997,84416	5,99482
7215	3,85823,63354	6,01891	7245	3,86003,83898	5,99399
7216	3,85829,65245	6,01808	7246	3,86009,83297	5,99316
7217	3,85835,67053	6,01724	7247	3,86015,82613	5,99234
7218	3,85841,68777	6,01641	7248	3,86021,81847	5,99151
7219	3,85847,70418	6,01558	7249	3,86027,80998	5,99068
7220	3,85853,71976	6,01474	7250	3,86033,80066	5,98985
7221	3,85859,73450	6,01391	7251	3,86039,79051	5,98903
7222	3,85865,74841	6,01308	7252	3,86045,77954	5,98821
7223	3,85871,76149	6,01224	7253	3,86051,76775	5,98737
7224	3,85877,77373	6,01141	7254	3,86057,75512	5,98656
7225	3,85883,78514	6,01058	7255	3,86063,74168	5,98573
7226	3,85889,79572	6,00975	7256	3,86069,72741	5,58490
7227	3,85895,80547	6,00892	7257	3,86075,71231	5,98408
7228	3,85901,81439	6,00808	7258	3,86081,69639	5,98325
7229	3,85907,82247	6,00726	7259	3,86087,67964	5,98243
7230	3,85913,82973	6,00642	7260	3,86093,66207	5,98161

N.	Logarithmi	Differ.
7261	3,86099,64368	5,98078
7262	3,86105,62446	5,97996
7263	3,86111,60442	5,97913
7264	3,86117,58355	5,97831
7265	3,86123,56186	5,97749
7266	3,86129,53935	5,97667
7267	3,86135,51602	5,97584
7268	3,86141,49186	5,97503
7269	3,86147,46689	5,97420
7270	3,86153,44109	5,97337
7271	3,86159,41446	5,97256
7272	3,86165,38702	5,97174
7273	3,86171,35876	5,97091
7274	3,86177,32967	5,97010
7275	3,86183,29977	5,96927
7276	3,86189,26904	5,96845
7277	3,86195,23749	5,96764
7278	3,86201,20513	5,96681
7279	3,86207,17194	5,96599
7280	3,86213,13793	5,96518
7281	3,86219,10311	5,96435
7282	3,86225,06746	5,96354
7283	3,86231,03100	5,96271
7284	3,86236,99371	5,96190
7285	3,86242,95561	5,96108
7286	3,86248,91669	5,96026
7287	3,86254,87695	5,95945
7288	3,86260,83640	5,95862
7289	3,86266,79502	5,95781
7290	3,86272,75283	5,95699

N.	Logarithmi	Differ.
7291	3,86278,70982	5,95618
7292	3,86284,66600	5,95536
7293	3,86290,62136	5,95454
7294	3,86296,57590	5,95372
7295	3,86302,52962	5,95291
7296	3,86308,48253	5,95210
7297	3,86314,43463	5,95127
7298	3,86320,38590	5,95047
7299	3,86326,33637	5,94964
7300	3,86332,28601	5,94883
7301	3,86338,23484	5,94802
7302	3,86344,18286	5,94720
7303	3,86350,13006	5,94639
7304	3,86356,07645	5,94558
7305	3,86362,02203	5,94476
7306	3,86367,96679	5,94394
7307	3,86373,91073	5,94314
7308	3,86379,85387	5,94232
7309	3,86385,79619	5,94151
7310	3,86391,73770	5,94069
7311	3,86397,67839	5,93988
7312	3,86403,61827	5,93907
7313	3,86409,55734	5,93826
7314	3,86415,49560	5,93745
7315	3,86421,43305	5,93663
7316	3,86427,36968	5,93582
7317	3,86433,30550	5,93502
7318	3,86439,24052	5,93420
7319	3,86445,17472	5,93339
7320	3,86451,10811	5,93258

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
7321	3,86457,04069	5,93176	7351	3,86634,64227	5,90757
7322	3,86462,97245	5,93096	7352	3,86640,54984	5,90676
7323	3,86468,90341	5,93015	7353	3,86646,45660	5,90595
7324	3,86474,83356	5,92934	7354	3,86652,36255	5,90516
7325	3,86480,76290	5,92853	7355	3,86658,26771	5,90435
7326	3,86486,69143	5,92772	7356	3,86664,17206	5,90354
7327	3,86492,61915	5,92692	7357	3,86670,07560	5,90275
7328	3,86498,54607	5,92610	7358	3,86675,97835	5,90194
7329	3,86504,47217	5,92529	7359	3,86681,88029	5,90114
7330	3,86510,39746	5,92449	7360	3,86687,78143	5,90034
7331	3,86516,32195	5,92368	7361	3,86693,68177	5,89954
7332	3,86522,24563	5,92287	7362	3,86699,58131	5,89874
7333	3,86528,16850	5,92206	7363	3,86705,48005	5,89793
7334	3,86534,09056	5,92126	7364	3,86711,37798	5,89714
7335	3,86540,01182	5,92045	7365	3,86717,27512	5,89633
7336	3,86545,93227	5,91964	7366	3,86723,17145	5,89554
7337	3,86551,85191	5,91883	7367	3,86729,06699	5,89473
7338	3,86557,77074	5,91803	7368	3,86734,96172	5,89393
7339	3,86563,68877	5,91722	7369	3,86740,85565	5,89314
7340	3,86569,60599	5,91642	7370	3,86746,74879	5,89233
7341	3,86575,52241	5,91561	7371	3,86752,64112	5,89153
7342	3,86581,43802	5,91480	7372	3,86758,53265	5,89074
7343	3,86587,35282	5,91400	7373	3,86764,42339	5,88994
7344	3,86593,26682	5,91319	7374	3,86770,31333	5,88914
7345	3,86599,18001	5,91239	7375	3,86776,20247	5,88833
7346	3,86605,09240	5,91158	7376	3,86782,09080	5,88755
7347	3,86611,00398	5,91078	7377	3,86787,97835	5,88674
7348	3,86616,91476	5,90998	7378	3,86793,86509	5,88594
7349	3,86622,82474	5,90917	7379	3,86799,75103	5,88515
7350	3,86628,73391	5,90836	7380	3,86805,63618	5,88435

N.	Logarithmi	Differ.
7381	3,86811,52053	5,88356
7382	3,86817,40409	5,88275
7383	3,86823,28684	5,88196
7384	3,86829,16880	5,88116
7385	3,86835,04996	5,88037
7386	3,86840,93033	5,87957
7387	3,86846,80990	5,87878
7388	3,86852,68868	5,87798
7389	3,86858,56666	5,87718
7390	3,86864,44384	5,87639
7391	3,86870,32023	5,87559
7392	3,86676,19582	5,87480
7393	3,86882,07062	5,87400
7394	3,86887,94462	5,87321
7395	3,86893,81783	5,87242
7396	3,86899,69025	5,87162
7397	3,86905,56187	5,87083
7398	3,86911,43270	5,87003
7399	3,86917,30273	5,86924
7400	3,86923,17197	5,86845
7401	3,86929,04042	5,86766
7402	3,86934,90808	5,86686
7403	3,86940,77494	5,86607
7404	3,86946,64101	5,86528
7405	3,86952,50629	5,86448
7406	3,86958,37077	5,86370
7407	3,86964,23447	5,86290
7408	3,86970,09737	5,86211
7409	3,86975,95948	5,86132
7410	3,86981,82080	5,86053

N.	Logarithmi	Differ.
7411	3,86987,68133	5,85973
7412	3,86993,54106	5,85895
7413	3,86999,40001	5,85816
7414	3,87005,25817	5,85737
7415	3,87011,11554	5,85657
7416	3,87016,97211	5,85579
7417	3,87022,82790	5,85500
7418	3,87028,68290	5,85421
7419	3,87034,53711	5,85342
7420	3,87040,39053	5,85263
7421	3,87046,24316	5,85184
7422	3,87052,09500	5,85106
7423	3,87057,94606	5,85026
7424	3,87063,79632	5,84948
7425	3,87069,64580	5,84869
7426	3,87075,49449	5,84790
7427	3,87081,34239	5,84712
7428	3,87087,18951	5,84632
7429	3,87093,03583	5,84555
7430	3,87098,88138	5,84477
7431	3,87104,72613	5,84397
7432	3,87110,57010	5,84318
7433	3,87116,41328	5,84240
7434	3,87122,25568	5,84161
7435	3,87128,09729	5,84082
7436	3,87133,93811	5,84004
7437	3,87139,77815	5,83925
7438	3,87145,61740	5,83847
7439	3,87151,45587	5,83768
7440	3,87157,29355	5,83690

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
7441	3,87163,13045	5,83612	7471	3,87337,87364	5,81268
7442	3,87168,96657	5,83533	7472	3,87343,68632	5,81191
7443	3,87174,80190	5,83455	7473	3,87349,49823	5,81112
7444	3,87180,63645	5,83376	7474	3,87355,30935	5,81035
7445	3,87186,47021	5,83298	7475	3,87361,11970	5,80957
7446	3,87192,30319	5,83219	7476	3,87366,92927	5,80879
7447	3,87198,13538	5,83142	7477	3,87372,73806	5,80802
7448	3,87203,96680	5,83063	7478	3,87378,54608	5,80724
7449	3,87209,79743	5,82984	7479	3,87384,35332	5,80647
7450	3,87215,62727	5,82907	7480	3,87390,15979	5,80568
7451	3,87221,45634	5,82828	7481	3,87395,96547	5,80492
7452	3,87227,28462	5,82750	7482	3,87401,77039	5,80413
7453	3,87233,11212	5,82672	7483	3,87407,57452	5,80336
7454	3,87238,93884	5,82594	7484	3,87413,37788	5,80259
7455	3,87244,76478	5,82515	7485	3,87419,18047	5,80181
7456	3,87250,58993	5,82438	7486	3,87424,98228	5,80103
7457	3,87256,41431	5,82359	7487	3,87430,78331	5,80026
7458	3,87262,23790	5,82282	7488	3,87436,58357	5,79949
7459	3,87268,06072	5,82203	7489	3,87442,38306	5,79871
7460	3,87273,88275	5,82125	7490	3,87448,18177	5,79794
7461	3,87279,70400	5,82047	7491	3,87453,97971	5,79716
7462	3,87285,52447	5,81969	7492	3,87459,77687	5,79639
7463	3,87291,34416	5,81891	7493	3,87465,57326	5,79562
7464	3,87297,16307	5,81814	7494	3,87471,36888	5,79484
7465	3,87302,98121	5,81735	7495	3,87477,16372	5,79407
7466	3,87308,79856	5,81657	7496	3,87482,95779	5,79329
7467	3,87314,61513	5,81580	7497	3,87488,75108	5,79253
7468	3,87320,43093	5,81501	7498	3,87494,54361	5,79175
7469	3,87326,24594	5,81424	7499	3,87500,33536	5,79098
7470	3,87332,06018	5,81346	7500	3,87506,12634	5,79021

7380 7410

N.	Logarithmi	Differ.	N.	Logarithmi
7381	3,86811,52053		7411	3,86987,68133
7382	3,86817,40409	5,88356	7412	3,86993,54106
		5,88275		

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7410	3,86981,82080	5,86132	7440	3,87157,29355
		5,86053		

Logarithmi	Differ.	N.	Logarithmi	Differ.
3,87163,13045	5,83612	7471	3,87337,87364	5,81268
3,87168,96657	5,83533	7472	3,87343,68632	5,8[illegible]191
[illegible]				[illegible]112
				[illegible]035
				[illegible]957
				[illegible]879
				[illegible]802
				[illegible]724
				[illegible]647
				[illegible]68
				[illegible]92
				[illegible]13
				[illegible]36
				[illegible]59
				[illegible]81
				[illegible]03
				[illegible]26
				[illegible]49
				[illegible]71
				[illegible]94
				[illegible]16
				[illegible]39
				[illegible]62
				[illegible]84
				[illegible]07
				[illegible]29
				[illegible]3
				[illegible]75
3,87332,06018	5,81424	7499	3,87500,33536	5,79098
	5,81346	7500	3,87506,12634	5,79021

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N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
7381	3,86811,52053	5,88356	7411	3,86987,68133	5,8597[illegible]
7382	3,86817,40409	5,88275	7412	3,86993,54106	5,858[illegible]
7383	3,86823,28684	5,88196	7413	3,86999,40001	5,858[illegible]
7384	3,86829,16880	5,88116	7414	3,87005,25817	5,857[illegible]
7385	3,86835,04996	5,88037	7415	3,87011,11554	5,856[illegible]
7386	3,86840,93033	5,87957	7416	3,87016,97211	5,855[illegible]
7387	3,86846,80990	5,87878	7417	3,87022,82790	5,855[illegible]
7388	3,86852,68868	5,87798	7418	3,87028,68290	5,854[illegible]
7389	3,86858,56666	5,87718	7419	3,87034,53711	5,853[illegible]
7390	3,86864,44384	5,87639	7420	3,87040,39053	5,852[illegible]
7391	3,86870,32023	5,87559	7421	3,87046,24316	5,851[illegible]
7392	3,86676,19582	5,87480	7422	3,87052,09500	5,851[illegible]
7393	3,86882,07062	5,87400	7423	3,87057,94606	5,850[illegible]
7394	3,86887,94462	5,87321	7424	3,87063,79632	5,84[illegible]
7395	3,86893,81783	5,87242	7425	3,87069,64580	5,84[illegible]
7396	3,86899,69025	5,87162	7426	3,87075,49449	5,847[illegible]
7397	3,86905,56187	5,87083	7427	3,87081,34239	5,847[illegible]
7398	3,86911,43270	5,87003	7428	3,87087,18951	5,846[illegible]
7399	3,86917,30273	5,86924	7429	3,87093,03583	5,845[illegible]
7400	3,86923,17197	5,86845	7430	3,87098,88138	5,844[illegible]
7401	3,86929,04042	5,86766	7431	3,87104,72613	5,843[illegible]
7402	3,86934,90808	5,86686	7432	3,87110,57010	5,843[illegible]
7403	3,86940,77494	5,86607	7433	3,87116,41328	5,842[illegible]
7404	3,86946,64101	5,86528	7434	3,87122,25568	5,841[illegible]
7405	3,86952,50629	5,86448	7435	3,87128,09729	5,840[illegible]
7406	3,86958,37077	5,86370	7436	3,87133,93811	5,84004
7407	3,86964,23447	5,86290	7437	3,87139,77815	5,83925
7408	3,86970,09737	5,86211	7438	3,87145,61740	5,83847
7409	3,86975,95948	5,86132	7439	3,87151,45587	5,83768
7410	3,86981,82080	5,86053	7440	3,87157,29355	5,83690

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
7441	3,87163,13045	5,83612	7471	3,87337,87364	5,81268
7442	3,87168,96657	5,83533	7472	3,87343,68632	5,81191
7443	3,87174,80190	5,83455	7473	3,87349,49823	5,81112
7444	3,87180,63645	5,83376	7474	3,87355,30935	5,81035
7445	3,87186,47021	5,83298	7475	3,87361,11970	5,80957
7446	3,87192,30319	5,83219	7476	3,87366,92927	5,80879
7447	3,87198,13538	5,83142	7477	3,87372,73806	5,80802
7448	3,87203,96680	5,83063	7478	3,87378,54608	5,80724
7449	3,87209,79743	5,82984	7479	3,87384,35332	5,80647
7450	3,87215,62727	5,82907	7480	3,87390,15979	5,80568
7451	3,87221,45634	5,82828	7481	3,87395,96547	5,80492
7452	3,87227,28462	5,82750	7482	3,87401,77039	5,80413
7453	3,87233,11212	5,82672	7483	3,87407,57452	5,80336
7454	3,87238,93884	5,82594	7484	3,87413,37788	5,80259
7455	3,87244,76478	5,82515	7485	3,87419,18047	5,80181
7456	3,87250,58993	5,82438	7486	3,87424,98228	5,80103
7457	3,87256,41431	5,82359	7487	3,87430,78331	5,80026
7458	3,87262,23790	5,82282	7488	3,87436,58357	5,79949
7459	3,87268,06072	5,82203	7489	3,87442,38306	5,79871
7460	3,87273,88275	5,82125	7490	3,87448,18177	5,79794
7461	3,87279,70400	5,82047	7491	3,87453,97971	5,79716
7462	3,87285,52447	5,81969	7492	3,87459,77687	5,79639
7463	3,87291,34416	5,81891	7493	3,87465,57326	5,79562
7464	3,87297,16307	5,81814	7494	3,87471,36888	5,79484
7465	3,87302,98121	5,81735	7495	3,87477,16372	5,79407
7466	3,87308,79856	5,81657	7496	3,87482,95779	5,79329
7467	3,87314,61513	5,81580	7497	3,87488,75108	5,79253
7468	3,87320,43093	5,81501	7498	3,87494,54361	5,79175
7469	3,87326,24594	5,81424	7499	3,87500,33536	5,79098
7470	3,87332,06018	5,81346	7500	3,87506,12634	5,79021

N.	Logarithmi	Differ.
7501	3,87511,91655	5,78943
7502	3,87517,70598	5,78867
7503	3,87523,49465	5,78789
7504	3,87529,28254	5,78712
7505	3,87535,06966	5,78635
7506	3,87540,85601	5,78558
7507	3,87546,64159	5,78480
7508	3,87552,42639	5,78404
7509	3,87558,21043	5,78327
7510	3,87563,99370	5,78250
7511	3,87569,77620	5,78173
7512	3,87575,55793	5,78095
7513	3,87581,33888	5,78019
7514	3,87587,11907	5,77942
7515	3,87592,89849	5,77865
7516	3,87598,67714	5,77788
7517	3,87604,45502	5,77712
7518	3,87610,23214	5,77634
7519	3,87616,00848	5,77558
7520	3,87621,78406	5,77481
7521	3,87627,55887	5,77404
7522	3,87633,33291	5,77327
7523	3,87639,10618	5,77251
7524	3,87644,87869	5,77174
7525	3,87650,65043	5,77097
7526	3,87656,42140	5,77020
7527	3,87662,19160	5,76944
7528	3,87667,96104	5,76867
7529	3,87673,72971	5,76791
7530	3,87679,49762	5,76714

N.	Logarithmi	Differ.
7531	3,87685,26476	5,76637
7532	3,87691,03113	5,76561
7533	3,87696,79674	5,76485
7534	3,87702,56159	5,76408
7535	3,87708,32567	5,76331
7536	3,87714,08898	5,76255
7537	3,87719,85153	5,76178
7538	3,87725,61331	5,76102
7539	3,87731,37433	5,76026
7540	3,87737,13459	5,75949
7541	3,87742,89408	5,75873
7542	3,87748,65281	5,75796
7543	3,87754,41077	5,75720
7544	3,87760,16797	5,75644
7545	3,87765,92441	5,75568
7546	3,87771,68009	5,75491
7547	3,87777,43500	5,75415
7548	3,87783,18915	5,75339
7549	3,87788,94254	5,75262
7550	3,87794,64516	5,75187
7551	3,87800,44703	5,75110
7552	3,87806,19813	5,75034
7553	3,87811,94847	5,74958
7554	3,87817,69805	5,74882
7555	3,87823,44687	5,74805
7556	3,87829,19492	5,74730
7557	3,87834,94222	5,74654
7558	3,87840,68876	5,74578
7559	3,87846,43454	5,74501
7560	3,87852,17955	5,74425

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
7561	3,87857,92381	5,74349	7591	3,88029,89914	5,72080
7562	3,87863,66730	5,74274	7592	3,88035,61994	5,72005
7563	3,87869,41004	5,74198	7593	3,88041,33999	5,71929
7564	3,87875,15202	5,74122	7594	3,88047,05928	5,71854
7565	3,87880,89324	5,74046	7595	3,88052,77782	5,71779
7566	3,87886,63370	5,73970	7596	3,88058,49561	5,71703
7567	3,87892,37340	5,73894	7597	3,88064,21264	5,71628
7568	3,87898,11234	5,73818	7598	3,88069,92892	5,71553
7569	3,87903,85052	5,73743	7599	3,88075,64445	5,71478
7570	3,87909,58795	5,73667	7600	3,88081,35923	5,71402
7571	3,87915,32462	5,73591	7601	3,88087,07325	5,71328
7572	3,87921,06053	5,73515	7602	3,88092,78653	5,71252
7573	3,87926,79568	5,73440	7603	3,88098,49905	5,71177
7574	3,87932,53008	5,73364	7604	3,88104,21082	5,71102
7575	3,87938,26372	5,73288	7605	3,88109,92184	5,71027
7576	3,87943,99660	5,73212	7606	3,88115,63211	5,70952
7577	3,87949,72872	5,73137	7607	3,88121,34163	5,70876
7578	3,87955,46009	5,73062	7608	3,88127,05039	5,70802
7579	3,87961,19071	5,72985	7609	3,88132,75841	5,70727
7580	3,87966,92056	5,72910	7610	3,88138,46568	5,70651
7581	3,87972,64966	5,72835	7611	3,88144,17219	5,70577
7582	3,87978,37801	5,72759	7612	3,88149,87796	5,70502
7583	3,87984,10560	5,72683	7613	3,88155,58298	5,70427
7584	3,87989,83243	5,72608	7614	3,88161,28725	5,70352
7585	3,87995,55851	5,72533	7615	3,88166,99077	5,70277
7586	3,88001,28384	5,72457	7616	3,88172,69354	5,70202
7587	3,88007,00841	5,72381	7617	3,88178,39556	5,70127
7588	3,88012,73222	5,72306	7618	3,88184,09683	5,70053
7589	3,88018,45528	5,72231	7619	3,88189,79736	5,69977
7590	3,88024,17759	5,72155	7620	3,88195,49713	5,69903

N.	Logarithmi	Differ.
7621	3,88201,19616	
7622	3,88206,89444	5,69828
7623	3,88212,59198	5,69754
7624	3,88218,28876	5,69678
7625	3,88223,98480	5,69604
7626	3,88229,68009	5,69529
7627	3,88235,37464	5,69455
7628	3,88241,06844	5,69380
7629	3,88246,76149	5,69305
7630	3,88252,45380	5,69231
7631	3,88258,14536	5,69156
7632	3,88263,83617	5,69081
7633	3,88269,52624	5,69007
7634	3,88275,21556	5,68932
7635	3,88280,90414	5,68858
7636	3,88286,59197	5,68783
7637	3,88292,27906	5,68709
7638	3,88297,96540	5,68634
7639	3,88303,65100	5,68560
7640	3,88309,33586	5,68486
7641	3,88315,01997	5,68411
7642	3,88320,70334	5,68337
7643	3,88326,38596	5,68262
7644	3,88332,06784	5,66188
7645	3,88337,74897	5,68113
7646	3,88343,42937	5,68040
7647	3,88349,10902	5,67965
7648	3,88354,78793	5,67891
7649	3,88360,46609	5,67816
7650	3,88366,14352	5,67743
		5,67668

N.	Logarithmi	Differ.
7651	3,88371,82020	
7652	3,88377,49614	5,67594
7653	3,88383,17133	5,67519
7654	3,88388,84579	5,67446
7655	3,88394,51950	5,67371
7656	3,88400,19248	5,67298
7657	3,88405,86471	5,67223
7658	3,88411,53620	5,67149
7659	3,88417,20695	5,67075
7660	3,88422,87696	5,67001
7661	3,88428,54623	5,66927
7662	3,88434,21476	5,66853
7663	3,88439,88256	5,66780
7664	3,88445,54961	5,66705
7665	3,88451,21592	5,66631
7666	3,88456,88149	5,66557
7667	3,88462,54633	5,66484
7668	3,88468,21042	5,66409
7669	3,88473,87378	5,66336
7670	3,88479,53639	5,66261
7671	3,88485,19827	5,66188
7672	3,88490,85942	5,66115
7673	3,88496,51982	5,66040
7674	3,88502,17949	5,65967
7675	3,88507,83841	5,65892
7676	3,88513,49661	5,65820
7677	3,88519,15406	5,65745
7678	3,88524,81078	5,65672
7679	3,88530,46676	5,65598
7680	3,88536,12200	5,65524
		5,65451

N.	Logarithmi	Differ.
7681	3,88541,77651	5,65377
7682	3,88547,43028	5,65304
7683	3,88553,08332	5,65230
7684	3,88558,73562	5,65156
7685	3,88564,38718	5,65083
7686	3,88570,03801	5,65010
7687	3,88575,68811	5,64936
7688	3,88581,33747	5,64862
7689	3,88586,98609	5,64789
7690	3,88592,63398	5,64716
7691	3,88598,28114	5,64642
7692	3,88603,92756	5,64568
7693	3,88609,57324	5,64496
7694	3,88615,21820	5,64422
7695	3,88620,86242	5,64348
7696	3,88626,50590	5,64276
7697	3,88632,14866	5,64202
7698	3,88637,79068	5,64128
7699	3,88643,43196	5,64056
7700	3,88649,07252	5,63982
7701	3,88654,71234	5,63909
7702	3,88660,35143	5,63836
7703	3,88665,98979	5,63762
7704	3,88671,62741	5,63690
7705	3,88677,26431	5,63616
7706	3,88682,90047	5,63543
7707	3,88688,53590	5,63470
7708	3,88694,17060	5,63397
7709	3,88699,80457	5,63324
7710	3,88705,43781	5,63250

N.	Logarithmi	Differ.
7711	3,88711,07031	5,63178
7712	3,88716,70209	5,63105
7713	3,88722,33314	5,63031
7714	3,88727,96345	5,62959
7715	3,88733,59304	5,62886
7716	3,88739,22190	5,62812
7717	3,88744,85002	5,62740
7718	3,88750,47742	5,62667
7719	3,88756,10409	5,62594
7720	3,88761,73003	5,62522
7721	3,88767,35525	5,62448
7722	3,88772,97973	5,62375
7723	3,88778,60348	5,62303
7724	3,88784,22651	5,62230
7725	3,88789,84881	5,62157
7726	3,88795,47038	5,62084
7727	3,88801,09122	5,62012
7728	3,88806,71134	5,61939
7729	3,88812,33073	5,61866
7730	3,88817,94939	5,61794
7731	3,88823,56733	5,61721
7732	3,88829,18454	5,61648
7733	3,88834,80102	5,61575
7734	3,88840,41677	5,61503
7735	3,88846,03180	5,61431
7736	3,88851,64611	5,61358
7737	3,88857,25969	5,61285
7738	3,88862,87254	5,61213
7739	3,88868,48467	5,61140
7740	3,88874,09607	5,61068

N.	Logarithmi	Differ.
7741	3,88879,70675	5,60995
7742	3,88885,31670	5,60923
7743	3,88890,92593	5,60850
7744	3,88896,53443	5,60778
7745	3,88902,14221	5,60706
7746	3,88907,74927	5,60633
7747	3,88913,35560	5,60560
7748	3,88918,96120	5,60489
7749	3,88924,56609	5,60416
7750	3,88930,17025	5,60344
7751	3,88935,77369	5,60271
7752	3,88941,37640	5,60200
7753	3,88946,97840	5,60127
7754	3,88952,57967	5,60054
7755	3,88958,18021	5,59983
7756	3,88963,78004	5,59910
7757	3,88969,37914	5,59839
7758	3,88974,97753	5,59766
7759	3,88980,57519	5,59694
7760	3,88986,17213	5,59621
7761	3,88991,76834	5,59550
7762	3,88997,36384	5,59478
7763	3,89002,95862	5,59405
7764	3,89008,55267	5,59334
7765	3,89014,14601	5,59261
7766	3,89019,73862	5,59190
7767	3,89025,33052	5,59117
7768	3,89030,92169	5,59045
7769	3,89036,51214	5,58974
7770	3,89042,10188	5,58902

N.	Logarithmi	Differ.
7771	3,89047,69090	5,58829
7772	3,89053,27919	5,58758
7773	3,89058,86677	5,58686
7774	3,89064,45363	5,58614
7775	3,89070,03977	5,58542
7776	3,89075,62519	5,58471
7777	3,89081,20990	5,58398
7778	3,89086,79388	5,58327
7779	3,89092,37715	5,58255
7780	3,89097,95970	5,58183
7781	3,89103,54153	5,58112
7782	3,89109,12265	5,58039
7783	3,89114,70304	5,57969
7784	3,89120,28273	5,57896
7785	3,89125,86169	5,57825
7786	3,89131,43994	5,57753
7787	3,89137,01747	5,57681
7788	3,89142,59428	5,57610
7789	3,89148,17038	5,57539
7790	3,89153,74577	5,57466
7791	3,89159,32043	5,57396
7792	3,89164,89439	5,57323
7793	3,89170,46762	5,57253
7794	3,89176,04015	5,57180
7795	3,89181,61195	5,57109
7796	3,89187,18304	5,57038
7797	3,89192,75342	5,56967
7798	3,89198,32309	5,56894
7799	3,89203,89203	5,56824
7800	3,89209,46027	5,56752

N.	Logartihmi	Differ.	N.	Logarithmi	Differ.
7801	3,89215,02779	5,56681	7831	3,89381,72240	5,54548
7802	3,89220,59460	5,56609	7832	3,89387,26788	5,54477
7803	3,89226,16069	5,56538	7833	3,89392,81265	5,54407
7804	3,89231,72607	5,56467	7834	3,89398,35672	5,54336
7805	3,89237,29074	5,56396	7835	3,89403,90008	5,54265
7806	3,89242,85470	5,56324	7836	3,89409,44273	5,54195
7807	3,89248,41794	5,56253	7837	3,89414,98468	5,54123
7808	3,89253,98047	5,56181	7838	3,89420,52591	5,54053
7809	3,89259,54228	5,56111	7839	3,89426,06644	5,53983
7810	3,89265,10339	5,56039	7840	3,89431,60627	5,53912
7811	3,89270,67378	5,55968	7841	3,89437,14539	5,53841
7812	3,89276,22346	5,55897	7842	3,89442,68380	5,53770
7813	3,89281,78243	5,55826	7843	3,89448,22150	5,53700
7814	3,89287,34069	5,55755	7844	3,89453,75850	5,53629
7815	3,89292,89824	5,55683	7845	3,89459,29479	5,53559
7816	3,89298,45507	5,55613	7846	3,89464,83038	5,53488
7817	3,89304,01120	5,55541	7847	3,89470,36526	5,53418
7818	3,89309,56661	5,55470	7848	3,89475,89944	5,53347
7819	3,89315,12131	5,55400	7849	3,89481,43291	5,53276
7820	3,89320,67531	5,55328	7850	3,89486,96567	5,53207
7821	3,89326,22859	5,55257	7851	3,89492,49774	5,53135
7822	3,89331,78116	5,55186	7852	3,89498,02909	5,53066
7823	3,89337,33302	5,55116	7853	3,89503,55975	5,52994
7824	3,89342,88418	5,55044	7854	3,89509,08969	5,52925
7825	3,89348,43462	5,54974	7855	3,89514,61894	5,52854
7826	3,89353,98436	5,54902	7856	3,89520,14748	5,52783
7827	3,89359,53338	5,54832	7857	3,89525,67531	5,52714
7828	3,89365,08170	5,54761	7858	3,89531,20245	5,52643
7829	3,89370,62931	5,54690	7859	3,89536,72888	5,52572
7830	3,89376,17621	5,54619	7860	3,89542,25460	5,52503

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
7861	3,89547,77963	5,52432	7891	3,89713,20434	5,50332
7862	3,89553,30395	5,52362	7892	3,89718,70766	5,50262
7863	3,89558,82757	5,52291	7893	3,89724,21028	5,50193
7864	3,89564,35048	5,52222	7894	3,89729,71221	5,50122
7865	3,89569,87270	5,52151	7895	3,89735,21343	5,50054
7866	3,89575,39421	5,52081	7896	3,89740,71397	5,49983
7867	3,89580,91502	5,52010	7897	3,89746,21380	5,49914
7868	3,89586,43512	5,51941	7898	3,89751,71294	5,49844
7869	3,89591,95453	5,51871	7899	3,89757,21138	5,49775
7870	3,89597,47324	5,51800	7900	3,89762,70913	5,49705
7871	3,89602,99124	5,51730	7901	3,89768,20618	5,49635
7872	3,89608,50854	5,51660	7902	3,89773,70253	5,49566
7873	3,89614,02514	5,51591	7903	3,89779,19819	5,49497
7874	3,89619,54105	5,51520	7904	3,89784,69316	5,49427
7875	3,89625,05625	5,51450	7905	3,89790,18743	5,49357
7876	3,89630,57075	5,51380	7906	3,89795,68100	5,49288
7877	3,89636,08455	5,51310	7907	3,89801,17388	5,49218
7878	3,89641,59765	5,51240	7908	3,89806,66606	5,49149
7879	3,89647,11005	5,51170	7909	3,89812,15755	5,49080
7880	3,89652,62175	5,51100	7910	3,89817,64835	5,49010
7881	3,89658,13275	5,51030	7911	3,89823,13845	5,48941
7882	3,89663,64305	5,50961	7912	3,89828,62786	5,48871
7883	3,89669,15266	5,50890	7913	3,89834,11657	5,48802
7884	3,89674,66156	5,50821	7914	3,89839,60459	5,48733
7885	3,89680,16977	5,50750	7915	3,89845,09192	5,48663
7886	3,89685,67727	5,50681	7916	3,89850,57855	5,48594
7887	3,89691,18408	5,50611	7917	3,89856,06449	5,58525
7888	3,89696,69019	5,50542	7918	3,89861,54974	5,48456
7889	3,89702,19561	5,50471	7919	3,89867,03430	5,48386
7890	3,89707,70032	5,50402	7920	3,89872,51816	5,48317

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
7921	3,89878,00133	5,48248	7951	3,90042,17535	5,46179
7922	3,89883,48381	5,48178	7952	3,90047,63714	5,46111
7923	3,89888,96559	5,48110	7953	3,90053,09825	5,46041
7924	3,89894,44669	5,48040	7954	3,90058,55866	5,45974
7925	3,89899,92709	5,47971	7955	3,90064,01840	5,45905
7926	3,89905,40680	5,47902	7956	3,90069,47745	5,45836
7927	3,89910,88582	5,47833	7957	3,90074,93581	5,45767
7928	3,89916,36415	5,47764	7958	3,90080,39348	5,45699
7929	3,89921,84179	5,47694	7959	3,90085,85047	5,45630
7930	3,89927,31873	5,47626	7960	3,90091,30677	5,45562
7931	3,89932,79499	5,47556	7961	3,90096,76239	5,45493
7932	3,89938,27055	5,47488	7962	3,90102,21732	5,45425
7933	3,89943,74543	5,47418	7963	3,90107,67157	5,45357
7934	3,89949,21961	5,47350	7964	3,90113,12514	5,45287
7935	3,89954,69311	5,47280	7965	3,90118,57801	5,45220
7936	3,89960,16591	5,47212	7966	3,90124,03021	5,45151
7937	3,89965,63803	5,47143	7967	3,90129,48172	5,45082
7938	3,89971,10946	5,47073	7968	3,90134,93254	5,45014
7939	3,89976,58019	5,47005	7969	3,90140,38268	5,44946
7940	3,89982,05024	5,46936	7970	3,90145,83214	5,44877
7941	3,89987,51960	5,46867	7971	3,90151,28091	5,44809
7942	3,89992,98827	5,46798	7972	3,90156,72900	5,44741
7943	3,89998,45625	5,46730	7973	3,90162,17641	5,44672
7944	3,90003,92355	5,46660	7974	3,90167,62313	5,44604
7945	3,90009,39015	5,46592	7975	3,90173,06917	5,44536
7946	3,90014,85607	5,46523	7976	3,90178,51453	5,44468
7947	3,90020,32130	5,46454	7977	3,90183,95921	5,44399
7948	3,90025,78584	5,46386	7978	3,90189,40320	5,44331
7949	3,90031,24970	5,46317	7979	3,90194,84651	5,44263
7950	3,90036,71287	5,46248	7980	3,90200,28914	5,44194

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
7981	3,90205,73108	5,44126	8011	3,90368,67317	5,42089
7982	3,90211,17234	5,44059	8012	3,90374,09406	5,42021
7983	3,90216,61293	5,43990	8013	3,90379,51427	5,41954
7984	3,90222,05283	5,43922	8014	3,90384,93381	5,41886
7985	3,90227,49205	5,43854	8015	3,90390,35267	5,41818
7986	3,90232,93059	5,43785	8016	3,90395,77085	5,41751
7987	3,90238,36844	5,43718	8017	3,90401,18836	5,41683
7988	3,90243,80562	5,43650	8018	3,90406,60519	5,41616
7989	3,90249,24212	5,43581	8019	3,90412,02135	5,41548
7990	3,90254,67793	5,43514	8020	3,90417,43683	5,41480
7991	3,90260,11307	5,43445	8021	3,90422,85163	5,41413
7992	3,90265,54752	5,43378	8022	3,90428,26576	5,41346
7993	3,90270,98130	5,43309	8023	3,90433,67922	5,41278
7994	3,90276,41439	5,43242	8024	3,90439,09200	5,41211
7995	3,90281,84681	5,43173	8025	3,90444,50411	5,41143
7996	3,90287,27854	5,43106	8026	3,90449,91554	5,41076
7997	3,90292,70960	5,43038	8027	3,90455,32630	5,41008
7998	3,90298,13998	5,42970	8028	3,90460,73638	5,40941
7999	3,90303,56968	5,42902	8029	3,90466,14579	5,40874
8000	3,90308,99870	5,42834	8030	3,90471,55453	5,40806
8001	3,90314,42704	5,42766	8031	3,90476,96259	5,40739
8002	3,90319,85470	5,42699	8032	3,90482,36998	5,40672
8003	3,90325,28169	5,42631	8033	3,90487,77670	5,40604
8004	3,90330,70800	5,42563	8034	3,90493,18274	5,40537
8005	3,90336,13363	5,42494	8035	3,90498,58811	5,40470
8006	3,90341,55857	5,42428	8036	3,90503,99281	5,40402
8007	3,90346,98285	5,42360	8037	3,90509,39683	5,40336
8008	3,90352,40645	5,42291	8038	3,90514,80019	5,40268
8009	3,90357,82936	5,42225	8039	3,90520,20287	5,40200
8010	3,90363,25161	5,42156	8040	3,90525,60487	5,40134

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
8041	3,90531,00621	5,40067	8071	3,90692,73473	5,38059
8042	3,90536,40688	5,39999	8072	3,90698,11532	5,37993
8043	3,90541,80687	5,39932	8073	3,90703,49525	5,37926
8044	3,90547,20619	5,39865	8074	3,90708,87451	5,37859
8045	3,90552,60484	5,39798	8075	3,90714,25310	5,37793
8046	3,90558,00282	5,39731	8076	3,90719,63103	5,37626
8047	3,90563,40013	5,39664	8077	3,90725,00729	5,37759
8048	3,90568,79677	5,59597	8078	3,90730,38488	5,37593
8049	3,90574,19274	5,39530	8079	3,90735,76081	5,37527
8050	3,90579,58804	5,39462	8080	3,90741,13608	5,37460
8051	3,90584,98266	5,39396	8081	3,90746,51068	5,37393
8052	3,90590,37662	5,39329	8082	3,90751,88461	5,37327
8053	3,90595,76991	5,39262	8083	3,90757,25788	5,37260
8054	3,90601,16253	5,39195	8084	3,90762,63048	5,37194
8055	3,90606,55448	5,39127	8085	3,90768,00242	5,37128
8056	3,90611,94575	5,39061	8086	3,90773,37370	5,37061
8057	3,90617,33636	5,38995	8087	3,90778,74431	5,36995
8058	3,90622,72631	5,38927	8088	3,90784,11426	5,36928
8059	3,90628,11558	5,38860	8089	3,90789,48354	5,36862
8060	3,90633,50418	5,38794	8090	3,90794,85216	5,36796
8061	3,90638,89212	5,38726	8091	3,90800,22012	5,36729
8062	3,90644,27938	5,38660	8092	3,90805,58741	5,36663
8063	3,90649,66598	5,38593	8093	3,90810,95404	5,36597
8064	3,90655,05191	5,38526	8094	3,90816,32001	5,36530
8065	3,90660,43717	5,38460	8095	3,90821,68531	5,36464
8066	3,90665,82177	5,38392	8096	3,90827,04995	5,36398
8067	3,90671,20569	5,38326	8097	3,90832,41393	5,36331
8068	3,90676,58895	5,38260	8098	3,90837,77724	5,36266
8069	3,90681,97155	5,38192	8099	3,90843,13990	5,36199
8070	3,90687,35347	5,38126	8100	3,90848,50189	5,36133

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
8101	3,90853,86322	5,36066	8131	3,91014,39611	5,34089
8102	3,90859,22388	5,36001	8132	3,91019,73700	5,34023
8103	3,90864,58389	5,35935	8133	3,91025,07723	5,33958
8104	3,90869,94324	5,35868	8134	3,91030,41681	5,33892
8105	3,90875,30192	5,35802	8135	3,91035,75573	5,33826
8106	3,90880,65994	5,35736	8136	3,91041,09399	5,33761
8107	3,90886,01730	5,35670	8137	3,91046,43160	5,33695
8108	3,90891,37400	5,35604	8138	3,91051,76855	5,33630
8109	3,90896,73004	5,35538	8139	3,91057,10485	5,33564
8110	3,90902,08542	5,35472	8140	3,91062,44049	5,33498
8111	3,90907,44014	5,35406	8141	3,91067,77547	5,33433
8112	3,90912,79420	5,35340	8142	3,91073,10980	5,33368
8113	3,90918,14760	5,35274	8143	3,91078,44348	5,33302
8114	3,90923,50034	5,35208	8144	3,91083,77650	5,33236
8115	3,90928,85242	5,35142	8145	3,91089,10886	5,33171
8116	3,90934,20384	5,35076	8146	3,91094,44057	5,33106
8117	3,90939,55460	5,35010	8147	3,91099,77163	5,33040
8118	3,90944,90470	5,34944	8148	3,91105,10203	5,32975
8119	3,90950,25414	5,34878	8149	3,91110,43178	5,32909
8120	3,90955,60292	5,34813	8150	3,91115,76087	5,32844
8121	3,90960,95105	5,34747	8151	3,91121,08931	5,32779
8122	3,90966,29852	5,34680	8152	3,91126,41710	5,32713
8123	3,90971,64532	5,34615	8153	3,91131,74423	5,32648
8124	3,90976,99147	5,34550	8154	3,91137,07071	5,32583
8125	3,90982,33697	5,34483	8155	3,91142,39654	5,32517
8126	3,90987,68180	5,34418	8156	3,91147,72171	5,32452
8127	3,90993,02598	5,34351	8157	3,91153,04623	5,32387
8128	3,90998,36949	5,34287	8158	3,91158,37010	5,32321
8129	3,91003,71236	5,34220	8159	3,91163,69331	5,32257
8130	3,91009,05456	5,34155	8160	3,91169,01588	5,32191

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
8161	3,91174,33779	5,32125	8191	3,91333,69259	5,30177
8162	3,91179,65904	5,32061	8192	3,91338,99436	5,30113
8163	3,91184,97965	5,31995	8193	3,91344,29549	5,30047
8164	3,91190,29960	5,31931	8194	3,91349,59596	5,29983
8165	3,91195,61891	5,31865	8195	3,91354,89579	5,29918
8166	3,91200,93756	5,31800	8196	3,91360,19497	5,29854
8167	3,91206,25556	5,31735	8197	3,91365,49351	5,29789
8168	3,91211,57291	5,31670	8198	3,91370,79140	5,29724
8169	3,91216,88961	5,31604	8199	3,91376,08864	5,29660
8170	3,91222,20565	5,31540	8200	3,91381,38524	5,29595
8171	3,91227,52105	5,31475	8201	3,91386,68119	5,29531
8172	3,91232,33580	5,31409	8202	3,91391,97650	5,29466
8173	3,91238,14989	5,31345	8203	3,91397,27116	5,29401
8174	3,91243,46334	5,31279	8204	3,91402,56517	5,29337
8175	3,91248,77613	5,31215	8205	3,91407,85854	5,29272
8176	3,91254,08828	5,31150	8206	3,91413,15126	5,29208
8177	3,91259,39978	5,31084	8207	3,91418,44334	5,29144
8178	3,91264,71062	5,31020	8208	3,91423,73478	5,29079
8179	3,91270,02082	5,30955	8209	3,91429,02557	5,29014
8180	3,91275,33037	5,30890	8210	3,91434,31571	5,28950
8181	3,91280,63927	5,30825	8211	3,91439,60521	5,28886
8182	3,91285,94752	5,30760	8212	3,91444,89407	5,28821
8183	3,91291,25512	5,30695	8213	3,91450,18228	5,28757
8184	3,91296,56207	5,30630	8214	3,91455,46985	5,28693
8185	3,91301,86837	5,30566	8215	3,91460,75678	5,28628
8186	3,91307,17403	5,30501	8216	3,91466,04306	5,28564
8187	3,91312,47904	5,30436	8217	3,91471,32870	5,28499
8188	3,91317,78340	5,30371	8218	3,91476,61369	5,28435
8189	3,91323,08711	5,30307	8219	3,91481,89804	5,28371
8190	3,91328,39018	5,30241	8220	3,91487,18175	5,28307

N.	Logarithmi	Differ.
8221	3,91492,46482	5,28242
8222	3,91497,74724	5,28179
8223	3,91503,02903	5,28114
8224	3,91508,31017	5,28049
8225	3,91513,59066	5,27986
8226	3,91518,87052	5,27921
8227	3,91524,14973	5,27857
8228	3,91529,42830	5,27793
8229	3,91534,70623	5,27729
8230	3,91539,98352	5,27665
8231	3,91545,26017	5,27601
8232	3,91550,53618	5,27536
8233	3,91555,81154	5,27473
8234	3,91561,08627	5,27408
8235	3,91566,36035	5,27344
8236	3,91571,63379	5,27281
8237	3,91576,90660	5,27216
8238	3,91582,17876	5,27153
8239	3,91587,45029	5,27088
8240	3,91592,72117	5,27024
8241	3,91597,99141	5,26961
8242	3,91603,26102	5,26896
8243	3,91608,52998	5,26833
8244	3,91613,79831	5,26769
8245	3,91619,06600	5,26705
8246	3,91624,33305	5,26641
8247	3,91629,59946	5,26577
8248	3,91634,86523	5,26513
8249	3,91640,13036	5,26449
8250	3,91645,39485	5,26386

N.	Logarithmi	Differ.
8251	3,91650,65871	5,26322
8252	3,91655,92193	5,26258
8253	3,91661,18451	5,26194
8254	3,91666,44645	5,26131
8255	3,91671,70776	5,26067
8256	3,91676,96843	5,26003
8257	3,91682,22846	5,25939
8258	3,91687,48785	5,25876
8259	3,91692,74661	5,25812
8260	3,91698,00473	5,25749
8261	3,91703,26222	5,25684
8262	3,91708,51906	5,25622
8263	3,91713,77528	5,25557
8264	3,91719,03085	5,25494
8265	3,91724,28579	5,25430
8266	3,91729,54009	5,25367
8267	3,91734,79376	5,25304
8268	3,91740,04680	5,25239
8269	3,91745,29919	5,25177
8270	3,91750,55096	5,25112
8271	3,91755,80208	5,25049
8272	3,91761,05257	5,24986
8273	3,91766,30243	5,24923
8274	3,91771,55166	5,24858
8275	3,91776,80024	5,24796
8276	3,91782,04820	5,24732
8277	3,91787,29552	5,24669
8278	3,91792,54221	5,24605
8279	3,91797,78826	5,24542
8280	3,91803,03368	5,24478

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
8281	3,91808,27846	5,24416	8311	3,91965,32823	5,22522
8282	3,91813,52262	5,24352	8312	3,91970,55345	5,22460
8283	3,91818,76614	5,24288	8313	3,91975,77805	5,22397
8284	3,91824,00902	5,24226	8314	3,91981,00202	5,22334
8285	3,91829,25128	5,24162	8315	3,91986,22536	5,22271
8286	3,91834,49290	5,24098	8316	3,91991,44807	5,22208
8287	3,91839,73388	5,24036	8317	3,91996,67015	5,22145
8288	3,91844,97424	5,23972	8318	3,92001,89160	5,22083
8289	3,91850,21396	5,23910	8319	3,92007,11243	5,22020
8290	3,91855,45306	5,23845	8320	3,92012,33263	5,21957
8291	3,91860,69151	5,23783	8321	3,92017,55220	5,21895
8292	3,91865,92934	5,23720	8322	3,92022,77115	5,21831
8293	3,91871,16654	5,23656	8323	3,92027,98946	5,21769
8294	3,91876,40310	5,23594	8324	3,92033,20715	5,21707
8295	3,91881,63904	5,23530	8325	3,92038,42422	5,21644
8296	3,91886,87434	5,23467	8326	3,92043,64066	5,21581
8297	3,91892,10901	5,23404	8327	3,92048,85647	5,21518
8298	3,91897,34305	5,23341	8328	3,92054,07165	5,21456
8299	3,91902,57646	5,23278	8329	3,92059,28621	5,21393
8300	3,91907,80924	5,23215	8330	3,92064,50014	5,21331
8301	3,91913,04139	5,23151	8331	3,92069,71345	5,21268
8302	3,91918,27290	5,23089	8332	3,92074,92613	5,21205
8303	3,91923,50379	5,23026	8333	3,92080,13818	5,21143
8304	3,91928,73405	5,22963	8334	3,92085,34961	5,21081
8305	3,91933,96368	5,22900	8335	3,92090,56042	5,21018
8306	3,91939,19268	5,22837	8336	3,92095,77060	5,20955
8307	3,91944,42105	5,22774	8337	3,92100,98015	5,20893
8308	3,91949,64879	5,22711	8338	3,92106,18908	5,20830
8309	3,91954,87590	5,22648	8339	3,92111,39738	5,20768
8310	3,91960,10238	5,22585	8340	3,92116,60506	5,20706

N.	Logarithmi	Differ.
8221	3,91492,46482	5,28242
8222	3,91497,74724	5,28179
8223	3,91503,02903	5,28114
8224	3,91508,31017	5,28049
8225	3,91513,59066	5,27986
8226	3,91518,87052	5,27921
8227	3,91524,14973	5,27857
8228	3,91529,42830	5,27793
8229	3,91534,70623	5,27729
8230	3,91539,98352	5,27665
8231	3,91545,26017	5,27601
8232	3,91550,53618	5,27536
8233	3,91555,81154	5,27473
8234	3,91561,08627	5,27408
8235	3,91566,36035	5,27344
8236	3,91571,63379	5,27281
8237	3,91576,90660	5,27216
8238	3,91582,17876	5,27153
8239	3,91587,45029	5,27088
8240	3,91592,72117	5,27024
8241	3,91597,99141	5,26961
8242	3,91603,26102	5,26896
8243	3,91608,52998	5,26833
8244	3,91613,79831	5,26769
8245	3,91619,06600	5,26705
8246	3,91624,33305	5,26641
8247	3,91629,59946	5,26577
8248	3,91634,86523	5,26513
8249	3,91640,13036	5,26449
8250	3,91645,39485	5,26386

N.	Logarithmi	Differ.
8251	3,91650,65871	5,26322
8252	3,91655,92193	5,26258
8253	3,91661,18451	5,26194
8254	3,91666,44645	5,26131
8255	3,91671,70776	5,26067
8256	3,91676,96843	5,26003
8257	3,91682,22846	5,25939
8258	3,91687,48785	5,25876
8259	3,91692,74661	5,25812
8260	3,91698,00473	5,25749
8261	3,91703,26222	5,25684
8262	3,91708,51906	5,25622
8263	3,91713,77528	5,25557
8264	3,91719,03085	5,25494
8265	3,91724,28579	5,25430
8266	3,91729,54009	5,25367
8267	3,91734,79376	5,25304
8268	3,91740,04680	5,25239
8269	3,91745,29919	5,25177
8270	3,91750,55096	5,25112
8271	3,91755,80208	5,25049
8272	3,91761,05257	5,24986
8273	3,91766,30243	5,24923
8274	3,91771,55166	5,24858
8275	3,91776,80024	5,24796
8276	3,91782,04820	5,24732
8277	3,91787,29552	5,24669
8278	3,91792,54221	5,24605
8279	3,91797,78826	5,24542
8280	3,91803,03368	5,24478

N.	Logarithmi	Differ.
8281	3,91808,27846	5,24416
8282	3,91813,52262	5,24352
8283	3,91818,76614	5,24288
8284	3,91824,00902	5,24226
8285	3,91829,25128	5,24162
8286	3,91834,49290	5,24098
8287	3,91839,73388	5,24036
8288	3,91844,97424	5,23972
8289	3,91850,21396	5,23910
8290	3,91855,45306	5,23845
8291	3,91860,69151	5,23783
8292	3,91865,92934	5,23720
8293	3,91871,16654	5,23656
8294	3,91876,40310	5,23594
8295	3,91881,63904	5,23530
8296	3,91886,87434	5,23467
8297	3,91892,10901	5,23404
8298	3,91897,34305	5,23341
8299	3,91902,57646	5,23278
8300	3,91907,80924	5,23215
8301	3,91913,04139	5,23151
8302	3,91918,27290	5,23089
8303	3,91923,50379	5,23026
8304	3,91928,73405	5,22963
8305	3,91933,96368	5,22900
8306	3,91939,19268	5,22837
8307	3,91944,42105	5,22774
8308	3,91949,64879	5,22711
8309	3,91954,87590	5,22648
8310	3,91960,10238	5,22585

N.	Logarithmi	Differ.
8311	3,91965,32823	5,22522
8312	3,91970,55345	5,22460
8313	3,91975,77805	5,22397
8314	3,91981,00202	5,22334
8315	3,91986,22536	5,22271
8316	3,91991,44807	5,22208
8317	3,91996,67015	5,22145
8318	3,92001,89160	5,22083
8319	3,92007,11243	5,22020
8320	3,92012,33263	5,21957
8321	3,92017,55220	5,21895
8322	3,92022,77115	5,21831
8323	3,92027,98946	5,21769
8324	3,92033,20715	5,21707
8325	3,92038,42422	5,21644
8326	3,92043,64066	5,21581
8327	3,92048,85647	5,21518
8328	3,92054,07165	5,21456
8329	3,92059,28621	5,21393
8330	3,92064,50014	5,21331
8331	3,92069,71345	5,21268
8332	3,92074,92613	5,21205
8333	3,92080,13818	5,21143
8334	3,92085,34961	5,21081
8335	3,92090,56042	5,21018
8336	3,92095,77060	5,20955
8337	3,92100,98015	5,20893
8338	3,92106,18908	5,20830
8339	3,92111,39738	5,20768
8340	3,92116,60506	5,20706

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
8341	3,92121,81212	5,20643	8371	3,92277,73419	5,18778
8342	3,92127,01855	5,20581	8372	3,92282,92197	5,18715
8343	3,92132,22436	5,20518	8373	3,92288,10912	5,18654
8344	3,92137,42954	5,20456	8374	3,92293,29566	5,18591
8345	3,92142,63410	5,20394	8375	3,92298,48157	5,18530
8346	3,92147,83804	5,20331	8376	3,92303,66687	5,18467
8347	3,92153,04135	5,20269	8377	3,92308,85154	5,18406
8348	3,92158,24404	5,20207	8378	3,92314,03560	5,18344
8349	3,92163,44611	5,20144	8379	3,92319,21904	5,18282
8350	3,92168,64755	5,20082	8380	3,92324,40186	5,18221
8351	3,92173,84837	5,20020	8381	3,92329,58407	5,18158
8352	3,92179,04857	5,19957	8382	3,92334,76565	5,18097
8353	3,92184,24814	5,19895	8383	3,92339,94662	5,18034
8354	3,92189,44709	5,19833	8384	3,92345,12696	5,17973
8355	3,92194,64542	5,19771	8385	3,92350,30669	5,17912
8356	3,92199,84313	5,19709	8386	3,92355,48581	5,17849
8357	3,92205,04022	5,19646	8387	3,92360,66430	5,17788
8358	3,92210,23668	5,19584	8388	3,92365,84218	5,17726
8359	3,92215,43252	5,19522	8389	3,92371,01944	5,17664
8360	3,92220,62774	5,19460	8390	3,92376,19608	5,17603
8361	3,92225,82234	5,19398	8391	3,92381,37211	5,17541
8362	3,92231,01632	5,19336	8392	3,92386,54752	5,17479
8363	3,92236,20968	5,19273	8393	3,92391,72231	5,17418
8364	3,92241,40241	5,19212	8394	3,92396,89649	5,17356
8365	3,92246,59453	5,19149	8395	3,92402,07005	5,17294
8366	3,92251,78602	5,19088	8396	3,92407,24299	5,17233
8367	3,92256,97690	5,19025	8397	3,92412,41532	5,17171
8368	3,92262,16715	5,18964	8398	3,92417,58703	5,17110
8369	3,92267,35679	5,18901	8399	3,92422,75813	5,17048
8370	3,92272,54580	5,18839	8400	3,92427,92861	5,16986

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
8401	3,92433,09847	5,16925	8431	3,92587,90893	5,15086
8402	3,92438,26772	5,16863	8432	3,92593,05979	5,15024
8403	3,92443,43635	5,16802	8433	3,92598,21003	5,14964
8404	3,92448,60437	5,16741	8434	3,92603,35967	5,14902
8405	3,92453,77178	5,16679	8435	3,92608,50869	5,14842
8406	3,92458,93857	5,16617	8436	3,92613,65711	5,14780
8407	3,92464,10474	5,16556	8437	3,92618,80491	5,14719
8408	3,92469,27030	5,16495	8438	3,92623,95210	5,14659
8409	3,92474,43525	5,16433	8439	3,92629,09869	5,14597
8410	3,92479,59958	5,16372	8440	3,92634,24466	5,14537
8411	3,92484,76330	5,16310	8441	3,92639,39003	5,14475
8412	3,92489,92640	5,16249	8442	3,92644,53478	5,14415
8413	3,92495,08889	5,16188	8443	3,92649,67893	5,14353
8414	3,92500,25077	5,16126	8444	3,92654,82246	5,14293
8415	3,92505,41203	5,16065	8445	3,92659,96539	5,14232
8416	3,92510,57268	5,16004	8446	3,92665,10771	5,14171
8417	3,92515,73272	5,15942	8447	3,92670,24942	5,14110
8418	3,92520,89214	5,15881	8448	3,92675,39052	5,14049
8419	3,92526,05095	5,15820	8449	3,92680,53101	5,13988
8420	3,92531,20915	5,15759	8450	3,92685,67089	5,13928
8421	3,92536,36674	5,15697	8451	3,92690,81017	5,13867
8422	3,92541,52371	5,15636	8452	3,92695,94884	5,13806
8423	3,92546,68007	5,15575	8453	3,92701,08690	5,13745
8424	3,92551,83582	5,15513	8454	3,92706,22435	5,13684
8425	3,92556,99095	5,15453	8455	3,92711,36119	5,13624
8426	3,92562,14548	5,15391	8456	3,92716,49743	5,13563
8427	3,92567,29939	5,15330	8457	3,92721,63306	5,13502
8428	3,92572,45269	5,15269	8458	3,92726,76808	5,13442
8429	3,92577,60538	5,15208	8459	3,92731,90250	5,13380
8430	3,92582,75746	5,15147	8460	3,92737,03630	5,13321

N.	Logarithmi	Differ.
8461	3,92742,16951	5,13259
8462	3,92747,30210	5,13199
8463	3,92752,43409	5,13138
8464	3,92757,56547	5,13077
8465	3,92762,69624	5,13017
8466	3,92767,82641	5,12957
8467	3,92772,95598	5,12895
8468	3,92778,08493	5,12836
8469	3,92783,21329	5,12774
8470	3,92788,34103	5,12714
8471	3,92793,46817	5,12654
8472	3,92798,59471	5,12593
8473	3,92803,72064	5,12533
8474	3,92808,84597	5,12472
8475	3,92813,97069	5,12411
8476	3,92819,09480	5,12352
8477	3,92824,21832	5,12290
8478	3,92829,34122	5,12231
8479	3,92834,46353	5,12170
8480	3,92839,58523	5,12109
8481	3,92844,70632	5,12049
8482	3,92849,82681	5,11989
8483	3,92854,94670	5,11928
8484	3,92860,06598	5,11869
8485	3,92865,18467	5,11807
8486	3,92870,30274	5,11748
8487	3,92875,42022	5,11687
8488	3,92880,53709	5,11627
8489	3,92885,65336	5,11566
8490	3,92890,76902	5,11507

N.	Logarithmi	Differ.
8491	3,92895,88409	5,11446
8492	3,92900,99855	5,11386
8493	3,92906,11241	5,11326
8494	3,92911,22567	5,11265
8495	3,92916,33832	5,11205
8496	3,92921,45037	5,11146
8497	3,92926,56183	5,11085
8498	3,92931,67268	5,11024
8499	3,92936,78292	5,10965
8500	3,92941,89257	5,10905
8501	3,92947,00162	5,10844
8502	3,92952,11006	5,10785
8503	3,92957,21791	5,10724
8504	3,92962,32515	5,10664
8505	3,92967,43179	5,10605
8506	3,92972,53784	5,10544
8507	3,92977,64328	5,10484
8508	3,92982,74812	5,10425
8509	3,92987,85237	5,10364
8510	3,92992,95601	5,10304
8511	3,92998,05905	5,10245
8512	3,93003,16150	5,10184
8513	3,93008,26334	5,10124
8514	3,93013,36458	5,10065
8515	3,93018,46523	5,10005
8516	3,93023,56528	5,09944
8517	3,93028,66472	5,09885
8518	3,93033,76357	5,09825
8519	3,93038,86182	5,09766
8520	3,93043,95948	5,09705

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
8521	3,93049,05653	5,09646	8551	3,93201,69064	5,07858
8522	3,93054,15299	5,09585	8552	3,93206,76922	5,07798
8523	3,93059,24884	5,09526	8553	3,93211,84720	5,07739
8524	3,93064,34410	5,09467	8554	3,93216,92459	5,07680
8525	3,93069,43877	5,09406	8555	3,93222,00139	5,07620
8526	3,93074,53283	5,09347	8556	3,93227,07759	5,07561
8527	3,93079,62630	5,09287	8557	3,93232,15320	5,07501
8528	3,93084,71917	5,09227	8558	3,93237,22821	5,07443
8529	3,93089,81144	5,09168	8559	3,93242,30264	5,07383
8530	3,93094,90312	5,09108	8560	3,93247,37647	5,07324
8531	3,93099,99420	5,09048	8561	3,93252,44971	5,07264
8532	3,93105,08468	5,08988	8562	3,93257,52235	5,07205
8533	3,93110,17456	5,08929	8563	3,93262,59440	5,07146
8534	3,93115,26385	5,08870	8564	3,93267,66586	5,07087
8535	3,93120,35255	5,08809	8565	3,93272,73673	5,07028
8536	3,93125,44064	5,08750	8566	3,93277,80701	5,06968
8537	3,93130,52814	5,08691	8567	3,93282,87669	5,06909
8538	3,93135,61505	5,08631	8568	3,93287,94578	5,06850
8539	3,93140,70136	5,08571	8569	3,93293,01428	5,06791
8540	3,93145,78707	5,08512	8570	3,93298,08219	5,06732
8541	3,93150,87219	5,08452	8571	3,93303,14951	5,06673
8542	3,93155,95671	5,08393	8572	3,93308,21624	5,06613
8543	3,93161,04064	5,08333	8573	3,93313,28237	5,06555
8544	3,93166,12397	5,08274	8574	3,93318,34792	5,06495
8545	3,93171,20671	5,08214	8575	3,93323,41287	5,06436
8546	3,93176,28885	5,08155	8576	3,93328,47723	5,06378
8547	3,93181,37040	5,08095	8577	3,93333,54101	5,06318
8548	3,93186,45135	5,08036	8578	3,93338,60419	5,06259
8549	3,93191,53171	5,07976	8579	3,93343,66678	5,06200
8550	3,93196,61147	5,07917	8580	3,93348,72878	5,06142

N.	Logarithmi	Differ.
8581	3,93353,79020	5,06082
8582	3,93358,85102	5,06023
8583	3,93363,91125	5,05965
8584	3,93368,97090	5,05905
8585	3,93374,02995	5,05846
8586	3,93379,08841	5,05788
8587	3,93384,14629	5,05729
8588	3,93389,20358	5,05669
8589	3,93394,26027	5,05611
8590	3,93399,31638	5,05552
8591	3,93404,37190	5,05494
8592	3,93409,42684	5,05434
8593	3,93414,48118	5,05375
8594	3,93419,53493	5,05317
8595	3,93424,58810	5,05258
8596	3,93429,64068	5,05199
8597	3,93434,69267	5,05141
8598	3,93439,74408	5,05081
8599	3,93444,79489	5,05023
8600	3,93449,84512	5,04965
8601	3,93454,89477	5,04905
8602	3,93459,94382	5,04847
8603	3,93464,99229	5,04788
8604	3,93470,04017	5,04730
8605	3,93475,08747	5,04670
8606	3,93480,13417	5,04613
8607	3,93485,18030	5,04553
8608	3,93490,22583	5,04495
8609	3,93495,27078	5,04437
8610	3,93500,31515	5,04377

N.	Logarithmi	Differ.
8611	3,93505,35892	5,04320
8612	3,93510,40212	5,04260
8613	3,93515,44472	5,04202
8614	3,93520,48674	5,04144
8615	3,93525,52818	5,04085
8616	3,93530,56903	5,04026
8617	3,93535,60929	5,03969
8618	3,93540,64898	5,03909
8619	3,93545,68807	5,03851
8620	3,93550,72658	5,03793
8621	3,93555,76451	5,03734
8622	3,93560,80185	5,03676
8623	3,93565,83861	5,03617
8624	3,93570,87478	5,03559
8625	3,93575,91037	5,03501
8626	3,93580,94538	5,03442
8627	3,93585,97980	5,03384
8628	3,93591,01364	5,03326
8629	3,93596,04690	5,03267
8630	3,93601,07957	5,03209
8631	3,93606,11166	5,03151
8632	3,93611,14317	5,03092
8633	3,93616,17409	5,03034
8634	3,93621,20443	5,02976
8635	3,93626,23419	5,02918
8636	3,93631,26337	5,02859
8637	3,93636,29196	5,02801
8638	3,93641,31997	5,02743
8639	3,93646,34740	5,02685
8640	3,93651,37425	5,02626

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
8641	3,93656,40051	5,02569	8671	3,93806,91862	5,00830
8642	3,93661,42620	5,02510	8672	3,93811,92692	5,00772
8643	3,93666,45130	5,02452	8673	3,93816,93464	5,00714
8644	3,93671,47582	5,02394	8674	3,93821,94178	5,00657
8645	3,93676,49976	5,02336	8675	3,93826,94835	5,00598
8646	3,93681,52312	5,02278	8676	3,93831,95433	5,00542
8647	3,93686,54590	5,92219	8677	3,93836,95975	5,00483
8648	3,93691,56809	5,02162	8678	3,93841,96458	5,00426
8649	3,93696,58971	5,02104	8679	3,93846,96884	5,00368
8650	3,93701,61075	5,02045	8680	3,93851,97252	5,00310
8651	3,93706,63120	5,01988	8681	3,93856,97562	5,00253
8652	3,93711,65108	5,01929	8682	3,93861,97815	5,00195
8653	3,93716,67037	5,01872	8683	3,93866,98010	5,00138
8654	3,93721,68909	5,01813	8684	3,93871,98148	5,00080
8655	3,93726,70722	5,01756	8685	3,93876,98228	5,00022
8656	3,93731,72478	5,01697	8686	3,93881,98250	4,99965
8657	3,93736,74175	5,01640	8687	3,93886,98215	4,99907
8658	3,93741,75815	5,01581	8688	3,93891,93122	4,99850
8659	3,93746,77396	5,01524	8689	3,93896,97972	4,99792
8660	3,93751,78920	5,01466	8690	3,93901,97764	4,99735
8661	3,93756,80386	5,01408	8691	3,93906,97499	4,99677
8662	3,93761,81794	5,01350	8692	3,93911,97176	4,99620
8663	3,93766,83144	5,01292	8693	3,93916,96796	4,99563
8664	3,93771,84436	5,01234	8694	3,93921,96359	4,99504
8665	3,93776,85670	5,01177	8695	3,93926,95863	4,99448
8666	3,93781,86847	5,01119	8696	3,93931,95311	4,99390
8667	3,93786,87966	5,01060	8697	3,93936,94701	4,99332
8668	3,93791,89026	5,01004	8698	3,93941,94033	4,99275
8669	3,93796,90030	5,00945	8699	3,93946,93308	4,99218
8670	3,93801,90975	5,00887	8700	3,93951,92526	4,99161

N.	Logarithmi	Differ.
8701	3,93956,91687	4,99103
8702	3,93961,90790	4,99045
8703	3,93966,89835	4,98989
8704	3,93971,88824	4,98931
8705	3,93976,87755	4,98873
8706	3,93981,86628	4,98817
8707	3,93986,85445	4,98759
8708	3,93991,84204	4,98702
8709	3,93996,82906	4,98644
8710	3,94001,81550	4,98587
8711	3,94006,80137	4,98530
8712	3,94011,78667	4,98473
8713	3,94016,77140	4,98416
8714	3,94021,75556	4,98358
8715	3,94026,73914	4,98302
8716	3,94031,72216	4,98244
8717	3,94036,70460	4,98187
8718	3,94041,68647	4,98130
8719	3,94046,66777	4,98072
8720	3,94051,64849	4,98016
8721	3,94056,62865	4,97958
8722	3,94061,60823	4,97902
8723	3,94066,58725	4,97844
8724	3,94071,56569	4,97787
8725	3,94076,54356	4,97731
8726	3,94081,52087	4,97673
8727	3,94086,49760	4,97616
8728	3,94091,47376	4,97559
8729	3,94096,44935	4,97502
8730	3,94101,42437	4,97445

N.	Logarithmi	Differ.
8731	3,94106,39882	4,97388
8732	3,94111,37270	4,97332
8733	3,94116,34602	4,97274
8734	3,94121,31876	4,97217
8735	3,94126,29093	4,97161
8736	3,94131,26254	4,97103
8737	3,94136,23357	4,97047
8738	3,94141,20404	4,96989
8739	3,94146,17393	4,96933
8740	3,94151,14326	4,96876
8741	3,94156,11202	4,96820
8742	3,94161,08022	4,96762
8743	3,94166,04784	4,96705
8744	3,94171,01489	4,96649
8745	3,94175,98138	4,96592
8746	3,94180,94730	4,96535
8747	3,94185,91265	4,96479
8748	3,94190,87744	4,96421
8749	3,94195,84165	4,96365
8750	3,94200,80530	4,96308
8751	3,94205,76838	4,96252
8752	3,94210,73090	4,96195
8753	3,94215,69285	4,96138
8754	3,94220,65423	4,96081
8755	3,94225,61504	4,96025
8756	3,94230,57529	4,95968
8757	3,94235,53497	4,95912
8758	3,94240,49409	4,95854
8759	3,94245,45263	4,95799
8760	3,94250,41062	4,95741

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
8761	3,94255,36803	4,95685	8791	3,94403,82801	4,93993
8762	3,94260,32488	4,95629	8792	3,94408,76794	4,93938
8763	3,94265,28117	4,95572	8793	3,94413,70732	4,93881
8764	3,94270,23689	4,95515	8794	3,94418,64613	4,93825
8765	3,94275,19204	4,95459	8795	3,94423,58438	4,93769
8766	3,94280,14663	4,95403	8796	3,94428,52207	4,93713
8767	3,94285,10066	4,95345	8797	3,94433,45920	4,93656
8768	3,94290,05411	4,95290	8798	3,94438,39576	4,93601
8769	3,94295,00701	4,95233	8799	3,94443,33177	4,93545
8770	3,94299,95934	4,95176	8800	3,94448,26722	4,93488
8771	3,94304,91110	4,95120	8801	3,94453,20210	4,93432
8772	3,94309,86230	4,95064	8802	3,94458,13642	4,93377
8773	3,94314,81294	4,95007	8803	3,94463,07019	4,93320
8774	3,94319,76301	4,94950	8804	3,94468,00339	4,93264
8775	3,94324,71251	4,94895	8805	3,94472,93603	4,93208
8776	3,94329,66146	4,94838	8806	3,94477,86811	4,93152
8777	3,94334,60984	4,94781	8807	3,94482,79963	4,93097
8778	3,94339,55765	4,94725	8808	3,94487,73060	4,93040
8779	3,94344,50490	4,94669	8809	3,94492,66100	4,92984
8780	3,94349,45159	4,94613	8810	3,94497,59084	4,92928
8781	3,94354,39772	4,94556	8811	3,94502,52012	4,92873
8782	3,94359,34328	4,94500	8812	3,94507,44885	4,92816
8783	3,94364,28828	4,94443	8813	3,94512,37701	4,92761
8784	3,94369,23271	4,94387	8814	3,94517,30462	4,92704
8785	3,94374,17658	4,94331	8815	3,94522,23166	4,92649
8786	3,94379,11989	4,94275	8816	3,94527,15815	4,92593
8787	3,94384,06264	4,94218	8817	3,94532,08408	4,92537
8788	3,94389,00482	4,94163	8818	3,94537,00945	4,92481
8789	3,94393,94645	4,94106	8819	3,94541,93426	4,92425
8790	3,94398,88751	4,94050	8820	3,94546,85851	4,92370

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
8821	3,94551,78221	4,92313	8851	3,94699,23407	4,90646
8822	3,94556,70534	4,92258	8852	3,94704,14053	4,90589
8823	3,94561,62792	4,92202	8853	3,94709,04642	4,90534
8824	3,94566,54994	4,92147	8854	3,94713,95176	4,90479
8825	3,94571,47141	4,92090	8855	3,94718,85655	4,90424
8826	3,94576,39231	4,92035	8856	3,94723,76079	4,90368
8827	3,94581,31266	4,91979	8857	3,94728,66447	4,90312
8828	3,94586,23245	4,91923	8858	3,94733,56759	4,90258
8829	3,94591,15168	4,91868	8859	3,94738,47017	4,90202
8830	3,94596,07036	4,91812	8860	3,94743,37219	4,90147
8831	3,94600,98848	4,91756	8861	3,94748,27366	4,90091
8832	3,94605,90604	4,91700	8862	3,94753,17457	4,90036
8833	3,94610,82304	4,91645	8863	3,94758,07493	4,89981
8834	3,94615,73949	4,91589	8864	3,94762,97474	4,89925
8835	3,94620,65538	4,91534	8865	3,94767,87399	4,89871
8836	3,94625,57072	4,91478	8866	3,94772,77270	4,89815
8837	3,94630,48550	4,91422	8867	3,94777,67085	4,89759
8838	3,94635,39972	4,91367	8868	3,94782,56844	4,89705
8839	3,94640,31339	4,91311	8869	3,94787,46549	4,89649
8840	3,94645,22650	4,91256	8870	3,94792,36198	4,89594
8841	3,94650,13906	4,91200	8871	3,94797,25792	4,89539
8842	3,94655,05106	4,91144	8872	3,94802,15331	4,89484
8843	3,94659,95250	4,91089	8873	3,94807,04815	4,89429
8844	3,94664,87339	4,91033	8874	3,94811,94244	4,89373
8845	3,94669,78372	4,90978	8875	3,94816,83617	4,89319
8846	3,94674,69350	4,90923	8876	3,94821,72936	4,89263
8847	3,94679,60273	4,90867	8877	3,94826,62199	4,89208
8848	3,94684,51140	4,90811	8878	3,94831,51407	4,89153
8849	3,94689,41951	4,90756	8879	3,94836,40560	4,89098
8850	3,94694,32707	4,90700	8880	3,94841,29658	4,89043

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
[illegible]	3,94846,18701	4,88987	8911	3,94992,64437	4,87341
[illegible]	3,94851,07688	4,88933	8912	3,94997,51778	4,87287
[illegible]	3,94855,96621	4,88878	8913	3,95002,39065	4,87233
[illegible]	3,94860,45499	4,88822	8914	3,95007,26298	4,87177
[illegible]	3,94865,74321	4,88768	8915	3,95012,13475	4,87123
[illegible]	3,94870,63089	4,88713	8916	3,95017,00598	4,87068
[illegible]	3,94875,51802	4,88657	8917	3,95021,87666	4,87014
[illegible]	3,94880,40459	4,88603	8918	3,95026,74680	4,86959
[illegible]	3,94885,29062	4,88548	8919	3,95031,61639	4,86905
[illegible]	3,94890,17610	4,88492	8920	3,95036,48544	4,86850
[illegible]	3,94895,06102	4,88438	8921	3,95041,35394	4,86795
[illegible]	3,94899,94540	4,88383	8922	3,95046,22189	4,86741
[illegible]	3,94904,82923	4,88328	8923	3,95051,08930	4,86686
[illegible]	3,94909,71251	4,88273	8924	3,95055,95616	4,86632
[illegible]	3,94914,59524	4,88218	8925	3,95060,82248	4,86577
[illegible]	3,94919,47742	4,88164	8926	3,95065,68825	4,86523
[illegible]	3,94924,35906	4,88108	8927	3,95070,55348	4,86468
[illegible]	3,94929,24014	4,88054	8928	3,95075,41816	4,86414
[illegible]	3,94934,12068	4,87998	8929	3,95080,28230	4,86359
[illegible]	3,94939,00066	4,87944	8930	3,95085,14589	4,86305
[illegible]	3,94943,88010	4,87889	8931	3,95090,00894	4,86250
[illegible]	3,94948,75899	4,87835	8932	3,95094,87144	4,86196
[illegible]	3,94953,63734	4,87779	8933	3,95099,73340	4,86141
[illegible]	3,94958,51513	4,87725	8934	3,95104,59481	4,86087
[illegible]	3,94963,39238	4,87670	8935	3,95109,45568	4,86033
[illegible]	3,94968,26908	4,87615	8936	3,95114,31601	4,85978
[illegible]	3,94973,14523	4,87561	8937	3,95119,17579	4,85924
[illegible]	3,94978,02084	4,87505	8938	3,95124,03503	4,85870
[illegible]	3,94982,89589	4,87451	8939	3,95128,89373	3,85815
[illegible]	3,94987,77040	4,87397	8940	3,95133,75188	4,85761

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
8941	3,95138,60949	4,85706	8971	3,95284,08567	4,84082
8942	3,95143,46655	4,85653	8972	3,95288,92649	4,84029
8943	3,95148,32308	4,85597	8973	3,95293,76678	4,83974
8944	3,95153,17905	4,85544	8974	3,95298,60652	4,83921
8945	3,95158,03449	4,85489	8975	3,95303,44573	4,83866
8946	3,95162,88938	4,85435	8976	3,95308,28439	4,83813
8947	3,95167,74373	4,85381	8977	3,95313,12252	4,83759
8948	3,95172,59754	4,85327	8978	3,95317,96011	4,83705
8949	3,95177,45081	4,85272	8979	3,95322,79716	4,83651
8950	3,95182,30353	4,85218	8980	3,95327,63367	4,83597
8951	3,95187,15571	4,85164	8981	3,95332,46964	4,83543
8952	3,95192,00735	4,85110	8982	3,95337,30507	4,83490
8953	3,95196,85845	4,85055	8983	3,95342,13997	4,83436
8954	3,95201,70900	4,85002	8984	3,95346,97433	4,83381
8955	3,95206,55902	4,84947	8985	3,95351,80814	4,83329
8956	3,95211,40849	4,84893	8986	3,95356,64143	4,83274
8957	3,95216,25742	4,84839	8987	3,95361,47417	4,83220
8958	3,95221,10581	4,84785	8988	3,95366,30637	4,83167
8959	3,95225,95366	4,84731	8989	3,95371,13804	4,83113
8960	3,95230,80097	4,84676	8990	3,95375,96917	4,83060
8961	3,95235,64773	4,84623	8991	3,95380,79977	4,83005
8962	3,95240,49396	4,84568	8992	3,95385,62982	4,82952
8963	3,95245,33964	4,84515	8993	3,95390,45934	4,82898
8964	3,95250,18479	4,84460	8994	3,95395,28832	4,82845
8965	3,95255,02939	4,84406	8995	3,95400,11677	4,82791
8966	3,95259,87345	4,84353	8996	3,95404,94468	4,82737
8967	3,95264,71698	4,84298	8997	3,95409,77205	4,82683
8968	3,95269,55996	4,84244	8998	3,95414,59888	4,82630
8969	3,95274,40240	4,84190	8999	3,95419,42518	4,82576
8970	3,95279,24430	4,84137	9000	3,95424,25094	4,82523

Logarithmi	Differ.
3,95429,07617	4,82469
3,95433,90086	4,82415
3,95438,72501	4,82362
3,95443,54863	4,82309
3,95448,37172	4,82254
3,95453,19426	4,82201
3,95458,01627	4,82148
3,95462,83775	4,82094
3,95467,65869	4,82041
3,95472,47910	4,81987
3,95477,29897	4,81934
3,95482,11831	4,81880
3,95486,93711	4,81826
3,95491,75537	4,81774
3,95496,57311	4,81719
3,95501,39030	4,81667
3,95506,20697	4,81613
3,95511,02310	4,81559
3,95515,83869	4,81506
3,95520,65375	4,81453
3,95525,46828	4,81400
3,95530,28228	4,81346
3,95535,09574	4,81292
3,95539,90866	4,81240
3,95544,72106	4,81186
3,95549,53292	4,81133
3,95554,34425	4,81079
3,95559,15504	4,81026
3,95563,96530	4,80973
3,95568,77503	4,80920

N.	Logarithmi	Differ.
9031	3,95573,58423	4,80866
9032	3,95578,39289	4,80813
9033	3,95583,20102	4,80760
9034	3,95588,00862	4,80707
9035	3,95592,81569	4,80653
9036	3,95597,62222	4,80601
9037	3,95602,42823	4,80547
9038	3,95607,23370	4,80494
9039	3,95612,03864	4,80441
9040	3,95616,84305	4,80387
9041	3,95621,64692	4,80335
9042	3,95626,45027	4,80281
9043	3,95631,25308	4,80229
9044	3,95636,05537	4,80175
9045	3,95640,85712	4,80122
9046	3,95645,65834	4,80069
9047	3,95650,45903	4,80016
9048	3,95655,25919	4,79963
9049	3,95660,05882	4,79910
9050	3,95664,85792	4,79857
9051	3,95669,65649	4,79804
9052	3,95674,45453	4,79751
9053	3,95679,25204	4,79698
9054	3,95684,04902	4,79645
9055	3,95688,84547	4,79591
9056	3,95693,64138	4,79539
9057	3,95698,43677	4,79486
9058	3,95703,23163	4,79434
9059	3,95708,02597	4,79380
9060	3,95712,81977	4,79327

N.	Logarithmi	Differ.
9061	3,95717,61304	4,79274
9062	3,95722,40578	4,79222
9063	3,95727,19800	4,79169
9064	3,95731,98969	4,79115
9065	3,95736,78084	4,79063
9066	3,95741,57147	4,79010
9067	3,95746,36157	4,78958
9068	3,95751,15115	4,78904
9069	3,95755,94019	4,78852
9070	3,95760,72871	4,78798
9071	3,95765,51669	4,78746
9072	3,95770,30415	4,78694
9073	3,95775,09109	4,78640
9074	3,95779,87749	4,78588
9075	3,95784,66337	4,78535
9076	3,95789,44872	4,78482
9077	3,95794,23354	4,78430
9078	3,95799,01784	4,78377
9079	3,95803,80161	4,78324
9080	3,95808,58485	4,78272
9081	3,95813,36757	4,78219
9082	3,95818,14976	4,78166
9083	3,95822,93142	4,78113
9084	3,95827,71255	4,78061
9085	3,95832,49316	4,78009
9086	3,95837,27325	4,77956
9087	3,95842,05281	4,77903
9088	3,95846,83184	4,77850
9089	3,95851,61034	4,77798
9090	3,95856,38832	4,77746

N.	Logarithmi	Differ.
9091	3,95861,16578	4,77693
9092	3,95865,94271	4,77640
9093	3,95870,71911	4,77588
9094	3,95875,49499	4,77535
9095	3,95880,27034	4,77483
9096	3,95885,04517	4,77430
9097	3,95889,81947	4,77378
9098	3,95894,59325	4,77325
9099	3,95899,36650	4,77273
9100	3,95904,13923	4,77221
9101	3,95908,91144	4,77168
9102	3,95913,68312	4,77115
9103	3,95918,45427	4,77064
9104	3,95923,22491	4,77010
9105	3,95927,99501	4,76959
9106	3,95932,76460	4,76906
9107	3,95937,53366	4,76853
9108	3,95942,30219	4,76802
9109	3,95947,07021	4,76749
9110	3,95951,83770	4,76696
9111	3,95956,60466	4,76645
9112	3,95961,37111	4,76592
9113	3,95966,13703	4,76539
9114	3,95970,90242	4,76488
9115	3,95975,66730	4,76435
9116	3,95980,43165	4,76383
9117	3,95985,19548	4,76331
9118	3,95989,95879	4,76278
9119	3,95994,72157	4,76226
9120	3,95999,48383	4,76174

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
9121	3,96004,24557	4,76122	9151	3,96146,85554	4,74560
9122	3,96009,00679	4,76070	9152	3,96151,60114	4,74510
9123	3,96013,76749	4,76017	9153	3,96156,34624	4,74457
9124	3,96018,52766	4,75965	9154	3,96161,09081	4,74405
9125	3,96023,28731	4,75913	9155	3,96165,83486	4,74354
9126	3,96028,04644	4,75861	9156	3,96170,57840	4,74302
9127	3,96032,80505	4,75809	9157	3,96175,32142	4,74250
9128	3,96037,56314	4,75757	9158	3,96180,06392	4,74198
9129	3,96042,32071	4,75704	9159	3,96184,80590	4,74147
9130	3,96047,07775	4,75653	9160	3,96189,54737	4,74094
9131	3,96051,83428	4,75600	9161	3,96194,28831	4,74043
9132	3,96056,59028	4,75548	9162	3,96199,02874	4,73992
9133	3,96061,34576	4,75497	9163	3,96203,76866	4,73939
9134	3,96066,10073	4,75444	9164	3,96208,50805	4,73888
9135	3,96070,85517	4,75392	9165	3,96213,24693	4,73836
9136	3,96075,60909	4,75340	9166	3,96217,98529	4,73785
9137	3,96080,36249	4,75288	9167	3,96222,72314	4,73732
9138	3,96085,11537	4,75236	9168	3,96227,46046	4,73681
9139	3,96089,86773	4,75184	9169	3,96232,19727	4,73630
9140	3,96094,61957	4,75132	9170	3,96236,93357	4,73577
9141	3,96099,37089	4,75081	9171	3,96241,66934	4,73527
9142	3,96104,12170	4,75028	9172	3,96246,40461	4,73474
9143	3,96108,87198	4,74976	9173	3,96251,13935	4,73423
9144	3,96113,62174	4,74924	9174	3,96255,87358	4,73371
9145	3,96118,37098	4,74872	9175	3,96260,60729	4,73320
9146	3,96123,11970	4,74821	9176	3,96265,34049	4,73268
9147	3,96127,86791	4,74768	9177	3,96270,07317	4,73217
9148	3,96132,61559	4,74717	9178	3,96274,80534	4,73165
9149	3,96137,36276	4,74665	9179	3,96279,53699	4,73113
9150	3,96142,10941	4,74613	9180	3,96284,26812	4,73062

N.	Logarithmi	Differ.
9181	3,96288,99874	4,73010
9182	3,96293,72884	4,72959
9183	3,96298,45843	4,72908
9184	3,96303,18751	4,72855
9185	3,96307,91606	4,72805
9186	3,96312,64411	4,72753
9187	3,96317,37164	4,72701
9188	3,96322,09865	4,72650
9189	3,96326,82515	4,72599
9190	3,96331,55114	4,72547
9191	3,96336,27661	4,72496
9192	3,96341,00157	4,72444
9193	3,96345,72601	4,72393
9194	3,96350,44994	4,72342
9195	3,96355,17336	4,72290
9196	3,96359,89626	4,72239
9197	3,96364,61865	4,72187
9198	3,96369,34052	4,72137
9199	3,96374,06189	4,72084
9200	3,96378,78273	4,72034
9201	3,96383,50307	4,71982
9202	3,96388,22289	4,71931
9203	3,96392,94220	4,71880
9204	3,96397,66100	4,71828
9205	3,96402,37928	4,71778
9206	3,96407,09706	4,71726
9207	3,96411,81432	4,71674
9208	3,96416,53106	4,71624
9209	3,96421,24730	4,71572
9210	3,96425,96302	4,71521

N.	Logarithmi	Differ.
9211	3,96430,67823	4,71470
9212	3,96435,39293	4,71419
9213	3,96440,10712	4,71367
9214	3,96444,82079	4,71317
9215	3,96449,53396	4,71265
9216	3,96454,24661	4,71214
9217	3,96458,95875	4,71163
9218	3,96463,67038	4,71112
9219	3,96468,38150	4,71061
9220	3,96473,09211	4,71009
9221	3,96477,80220	4,70959
9222	3,96482,51179	4,70907
9223	3,96487,22086	4,70857
9224	3,96491,92943	4,70805
9225	3,96496,63748	4,70755
9226	3,96501,34503	4,70703
9227	3,96506,05206	4,70652
9228	3,96510,75858	4,70602
9229	3,96515,46460	4,70550
9230	3,96520,17010	4,70500
9231	3,96524,87510	4,70448
9232	3,96529,57958	4,70398
9233	3,96534,28356	4,70346
9234	3,96538,98702	4,70296
9235	3,96543,68998	4,70244
9236	3,96548,39242	4,70194
9237	3,96553,09436	4,70143
9238	3,96557,79579	4,70092
9239	3,96562,49671	4,70041
9240	3,96567,19712	4,69990

Logarithmi	Differ.
3,96571,89702	4,69940
3,96576,59642	4,69888
3,96581,29530	4,69838
3,96585,99368	4,69787
3,96590,69155	4,69736
3,96595,38891	4,69685
3,96600,08576	4,69635
3,96604,78211	4,69583
3,96609,47794	4,69533
3,96614,17327	4,69483
3,96618,86810	4,69431
3,96623,56241	4,69381
3,96628,25622	4,69330
3,96632,94952	4,69279
3,96637,64231	4,69228
3,96642,33459	4,69178
3,96647,02637	4,69127
3,96651,71764	4,69077
3,96656,40841	4,69026
3,96661,09867	4,68975
3,96665,78842	4,68925
3,96670,47767	4,68874
3,96675,16641	4,68823
3,96679,85464	4,68773
3,96684,54237	4,68722
3,96689,22959	4,68671
3,96693,91630	4,68621
3,96698,60251	4,68571
3,96703,28822	4,68519
3,96707,97341	4,68470

N.	Logarithmi	Differ.
9271	3,96712,65811	4,68419
9272	3,96717,34230	4,68368
9273	3,96722,02598	4,68318
9274	3,96726,70916	4,68267
9275	3,96731,39183	4,68217
9276	3,96736,07400	4,68166
9277	3,96740,75566	4,68116
9278	3,96745,43682	4,68065
9279	3,96750,11747	4,68015
9280	3,96754,79762	4,67965
9281	3,96759,47727	4,67914
9282	3,96764,15641	4,67864
9283	3,96768,83505	4,67813
9284	3,96773,51318	4,67763
9285	3,96778,19081	4,67712
9286	3,96782,86793	4,67662
9287	3,96787,54455	4,67612
9288	3,96792,22067	4,67562
9289	3,96796,89629	4,67511
9290	3,96801,57140	4,67461
9291	3,96806,24601	4,67410
9292	3,96810,92011	4,67360
9293	3,96815,59371	4,67310
9294	3,96820,26681	4,67260
9295	3,96824,93941	4,67209
9296	3,96829,61150	4,67160
9297	3,96834,28310	4,67108
9298	3,96838,95418	4,67059
9299	3,96843,62477	4,67009
9300	3,96848,29486	4,66958

N.	Logarithmi	Differ.
9301	3,96852,96444	4,66908
9302	3,96857,63352	4,66858
9303	3,96862,30210	4,66807
9304	3,96866,97017	4,66758
9305	3,96871,63775	4,66707
9306	3,96876,30482	4,66657
9307	3,96880,97139	4,66607
9308	3,96885,63746	4,66557
9309	3,96890,30303	4,66507
9310	3,96894,96810	4,66456
9311	3,96899,63266	4,66407
9312	3,96904,29673	4,66357
9313	3,96908,96030	4,66306
9314	3,96913,62336	4,66256
9315	3,96918,28592	4,66207
9316	3,96922,94799	4,66156
9317	3,96927,60955	4,66106
9318	3,96932,27061	4,66056
9319	3,96936,93117	4,66007
9320	3,96941,59124	4,65956
9321	3,96946,25080	4,65906
9322	3,96950,90986	4,65856
9323	3,96955,56842	4,65806
9324	3,96960,22648	4,65757
9325	3,96964,88405	4,65706
9326	3,96969,54111	4,65657
9327	3,96974,19768	4,65606
9328	3,96978,85374	4,65557
9329	3,96983,50931	4,75506
9330	3,96988,16437	4,65457

N.	Logarithmi	Differ.
9331	3,96992,81894	4,65407
9332	3,96997,47301	4,65357
9333	3,97002,12658	4,65307
9334	3,97006,77965	4,65258
9335	3,97011,43223	4,65207
9336	3,97016,08430	4,65158
9337	3,97020,73588	4,65108
9338	3,97025,38696	4,65058
9339	3,97030,03754	4,65008
9340	3,97034,68762	4,64959
9341	3,97039,33721	4,64909
9342	3,97043,98630	4,64858
9343	3,97048,63488	4,64810
9344	3,97053,28298	4,64759
9345	3,97057,93057	4,64710
9346	3,97062,57767	4,64660
9347	3,97067,22427	4,64610
9348	3,97071,87037	4,64561
9349	3,97076,51598	4,64511
9350	3,97081,16109	4,64461
9351	3,97085,80570	4,64412
9352	3,97090,44982	4,64361
9353	3,97095,09343	4,64313
9354	3,97099,73656	4,64262
9355	3,97104,37918	4,64213
9356	3,97109,02131	4,64164
9357	3,97113,66295	4,64114
9358	3,97118,30409	4,64064
9359	3,97122,94473	4,64014
9360	3,97127,58487	4,63965

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
61	3,97132,22452	4,63916	9391	3,97271,18405	4,62434
62	3,97136,86368	4,63866	9392	3,97275,80839	4,62384
63	3,97141,50234	4,63816	9393	3,97280,43223	4,62335
64	3,97146,14050	4,63767	9394	3,97285,05558	4,62286
65	3,97150,77817	4,63717	9395	3,97289,67844	4,62237
66	3,97155,41534	4,63668	9396	3,97294,30081	4,62188
67	3,97160,05202	4,63619	9397	3,97298,92269	4,62138
68	3,97164,68821	4,63568	9398	3,97303,54407	4,62089
69	3,97169,32389	4,63520	9399	3,97308,16496	4,62040
70	3,97173,95909	4,63470	9400	3,97312,78536	4,61991
71	3,97178,59379	4,63420	9401	3,97317,40527	4,61942
72	3,97183,22799	4,63371	9402	3,97322,02469	4,61892
73	3,97187,86170	4,63322	9403	3,97326,64361	4,61844
74	3,97192,49492	4,63272	9404	3,97331,26205	4,61794
75	3,97197,12764	4,63223	9405	3,97335,87999	4,61745
76	3,97201,75987	4,63173	9406	3,97340,49744	4,61696
77	3,97206,39160	4,63124	9407	3,97345,11440	4,61647
78	3,97211,02284	4,63075	9408	3,97349,73087	4,61598
79	3,97215,65359	4,63025	9409	3,97354,34685	4,61549
80	3,97220,28384	4,62976	9410	3,97358,96234	4,61500
81	3,97224,91360	4,62926	9411	3,97363,57734	4,61451
82	3,97229,54286	4,62877	9412	3,97368,19185	4,61402
83	3,97234,17163	4,62828	9413	3,97372,80587	4,61353
84	3,97238,79991	4,62779	9414	3,97377,41940	4,61304
85	3,97243,42770	4,62729	9415	3,97382,03244	4,61254
86	3,97248,05499	4,62680	9416	3,97386,64498	4,61206
87	3,97252,68179	4,62630	9417	3,97391,25704	4,61157
88	3,97257,30809	4,62582	9418	3,97395,86861	4,61108
89	3,97261,93391	4,62532	9419	3,97400,47969	4,61059
90	3,97266,55923	4,62482	9420	3,97405,09028	4,61010

N.	Logarithmi	Differ.
9421	3,97409,70038	4,60961
9422	3,97414,30999	4,60912
9423	3,97418,91911	4,60863
9424	3,97423,52774	4,60815
9425	3,97428,13589	4,60765
9426	3,97432,74354	4,60717
9427	3,97437,35071	4,60668
9428	3,97441,95739	4,60618
9429	3,97446,56357	4,60570
9430	3,97451,16927	4,60522
9431	3,97455,77449	4,60472
9432	3,97460,37921	4,60423
9433	3,97464,98344	4,60375
9434	3,97469,58719	4,60326
9435	3,97474,19045	4,60277
9436	3,97478,79322	4,60228
9437	3,97483,39550	4,60180
9438	3,97487,99730	4,60131
9439	3,97492,59861	4,60082
9440	3,97497,19943	4,60033
9441	3,97501,79976	4,59985
9442	3,97506,39961	4,59936
9443	3,97510,99897	4,59887
9444	3,97515,59784	4,59839
9445	3,97520,19623	4,59789
9446	3,97524,79412	4,59742
9447	3,97529,39154	4,59692
9448	3,97533,98846	4,59644
9449	3,97538,58490	4,59595
9450	3,97543,18085	4,59547

N.	Logarithmi	Differ.
9451	3,97547,77632	4,59498
9452	3,97552,37130	4,59449
9453	3,97556,96579	4,59401
9454	3,97561,55980	4,59352
9455	3,97566,15332	4,59303
9456	3,97570,74635	4,59255
9457	3,97575,33890	4,59207
9458	3,97579,93097	4,59158
9459	3,97584,52255	4,59109
9460	3,97589,11364	4,59061
9461	3,97593,70425	4,59012
9462	3,97598,29437	4,58964
9463	3,97602,88401	4,58915
9464	3,97607,47316	4,58867
9465	3,97612,06183	4,58818
9466	3,97616,65001	4,58770
9467	3,97621,23771	4,58722
9468	3,97625,82493	4,58673
9469	3,97630,41166	4,58624
9470	3,97634,99790	4,58576
9471	3,97639,58366	4,58528
9472	3,97644,16894	4,58479
9473	3,97648,75373	4,58431
9474	3,97653,33804	4,58382
9475	3,97657,92186	4,58335
9476	3,97662,50521	4,58285
9477	3,97667,08806	4,58238
9478	3,97671,67044	4,58189
9479	3,97676,25233	4,58140
9480	3,97680,83373	4,5809[illegible]

N.	Logarithmi	Differ.
9481	3,97685,41466	4,58044
9482	3,97689,99510	4,57996
9483	3,97694,57506	4,57947
9484	3,97699,15453	4,57899
9485	3,97703,73352	4,57851
9486	3,97708,31203	4,57803
9487	3,97712,89006	4,57754
9488	3,97717,46760	4,57706
9489	3,97722,04466	4,57658
9490	3,97726,62124	4,57610
9491	3,97731,19734	4,57561
9492	3,97735,77295	4,57514
9493	3,97740,34809	4,57465
9494	3,97744,92274	4,57417
9495	3,97749,49691	4,57368
9496	3,97754,07059	4,57321
9497	3,97758,64380	4,57272
9498	3,97763,21652	4,57225
9499	3,97767,78877	4,57176
9500	3,97772,36053	4,57128
9501	3,97776,93181	4,57080
9502	3,97781,50261	4,57032
9503	3,97786,07293	4,56983
9504	3,97790,64276	4,56936
9505	3,97795,21212	4,56888
9506	3,97799,78100	4,56839
9507	3,97804,34939	4,56792
9508	3,97808,91731	4,56743
9509	3,97813,48474	4,56695
9510	3,97818,05169	4,56648

N.	Logarithmi	Differ.
9511	3,97822,61817	4,56599
9512	3,97827,18416	4,56551
9513	3,97831,74967	4,56504
9514	3,97836,31471	4,56455
9515	3,97840,87926	4,56408
9516	3,97845,44334	4,56359
9517	3,97850,00693	4,56312
9518	3,97854,57005	4,56263
9519	3,97859,13268	4,56216
9520	3,97863,69484	4,56168
9521	3,97868,25652	4,56119
9522	3,97872,81771	4,56072
9523	3,97877,37843	4,56024
9524	3,97881,93867	4,55976
9525	3,97886,49843	4,55929
9526	3,97891,05772	4,55880
9527	3,97895,61652	4,55833
9528	3,97900,17485	4,55784
9529	3,97904,73269	4,55737
9530	3,97909,29006	4,55689
9531	3,97913,84695	4,55642
9532	3,97918,40337	4,55593
9533	3,97922,95930	4,55546
9534	3,97927,51476	4,55498
9535	3,97932,06974	4,55450
9536	3,97936,62424	4,55402
9537	3,97941,17826	4,55355
9538	3,97945,73181	4,55307
9539	3,97950,28488	4,55259
9540	3,97954,83747	4,55211

N.	Logarithmi	Differ.
9541	3,97959,38958	4,55164
9542	3,97963,94122	4,55116
9543	3,97968,49238	4,55069
9544	3,97973,04307	4,55020
9545	3,97977,59327	4,54973
9546	3,97982,14300	4,54926
9547	3,97986,69226	4,54877
9548	3,97991,24103	4,54830
9549	3,97995,78933	4,54783
9550	3,98000,33716	4,54735
9551	3,98004,88451	4,54687
9552	3,98009,43138	4,54639
9553	3,98013,97777	4,54592
9554	3,98018,52369	4,54545
9555	3,98023,06914	4,54497
9556	3,98027,61411	4,54449
9557	3,98032,15860	4,54402
9558	3,98036,70262	4,54354
9559	3,98041,24616	4,54307
9560	3,98045,78923	4,54259
9561	3,98050,33182	4,54212
9562	3,98054,87394	4,54164
9563	3,98059,41558	4,54116
9564	3,98063,95674	4,54070
9565	3,98068,49744	4,54021
9566	3,98073,03765	4,53975
9567	3,98077,57740	4,53926
9568	3,98082,11666	4,53880
9569	3,98086,65546	4,53832
9570	3,98091,19378	4,53784

N.	Logarithmi	Differ.
9571	3,98095,73162	4,53737
9572	3,98100,26899	4,53690
9573	3,98104,80589	4,53642
9574	3,98109,34231	4,53595
9575	3,98113,87826	4,53548
9576	3,98118,41374	4,53500
9577	3,98122,94874	4,53453
9578	3,98127,48327	4,53406
9579	3,98132,01733	4,53358
9580	3,98136,55091	4,53311
9581	3,98141,08402	4,53263
9582	3,98145,61665	4,53216
9583	3,98150,14881	4,53169
9584	3,98154,68050	4,53122
9585	3,98159,21172	4,53075
9586	3,98163,74247	4,53027
9587	3,98168,27274	4,52980
9588	3,98172,80254	4,52932
9589	3,98177,33186	4,52886
9590	3,98181,86072	4,52838
9591	3,98186,38910	4,52791
9592	3,98190,91701	4,52744
9593	3,98195,44445	4,52696
9594	3,98199,97141	4,52650
9595	3,98204,49791	4,52602
9596	3,98209,02393	4,52555
9597	3,98213,54948	4,52508
9598	3,98218,07456	4,52461
9599	3,98222,59917	4,52413
9600	3,98227,12330	4,52367

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
9601	3,98231,64697	4,52319	9631	3,98367,13829	4,50910
9602	3,98236,17016	4,52273	9632	3,98371,64739	4,50864
9603	3,98240,69289	4,52225	9633	3,98376,15603	4,50817
9604	3,98245,21514	4,52178	9634	3,98380,66420	4,50770
9605	3,98249,73692	4,53131	9635	3,98385,17190	4,50723
9606	3,98254,25823	4,52084	9636	3,98389,67913	4,50677
9607	3,98258,77907	4,52037	9637	3,98394,18590	4,50630
9608	3,98263,29944	4,51990	9638	3,98398,69220	4,50583
9609	3,98267,81934	4,51943	9639	3,98403,19803	4,50536
9610	3,98272,33877	4,51896	9640	3,98407,70339	4,50490
9611	3,98276,85773	4,51848	9641	3,98412,20829	4,50442
9612	3,98281,37621	4,51802	9642	3,98416,71271	4,50397
9613	3,98285,89423	4,51755	9643	3,98421,21668	4,50349
9614	3,98290,41178	4,51708	9644	3,98425,72017	4,50303
9615	3,98294,92886	4,51661	9645	3,98430,22320	4,50256
9616	3,98299,44547	4,51613	9646	3,98434,72576	4,50209
9617	3,98303,96160	4,51567	9647	3,98439,22785	4,50163
9618	3,98308,47727	4,51520	9648	3,98443,72948	4,50116
9619	3,98312,99247	4,51473	9649	3,98448,23064	4,50069
9620	3,98317,50720	4,51426	9650	3,98452,73133	4,50023
9621	3,98322,02146	4,51380	9651	3,98457,23156	4,49976
9622	3,98326,53526	4,51332	9652	3,98461,73132	4,49930
9623	3,98331,04858	4,51285	9653	3,98466,23062	4,49883
9624	3,98335,56143	4,51239	9654	3,98470,72945	4,49836
9625	3,98340,07382	4,51191	9655	3,98475,22781	4,49790
9626	3,98344,58573	4,51145	9656	3,98479,72571	4,49743
9627	3,98349,09718	4,51098	9657	3,98484,22314	4,49697
9628	3,98353,60816	4,51051	9658	3,98488,72011	4,49650
9629	3,98358,11867	4,51004	9659	3,98493,21661	4,49603
9630	3,98362,62871	4,50958	9660	3,98497,71264	4,49557

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
9661	3,98502,20821	4,49511	9691	3,98636,85936	4,48119
9662	3,98506,70332	4,49463	9692	3,98641,34055	4,48072
9663	3,98511,19795	4,49418	9693	3,98645,82127	4,48027
9664	3,98515,69213	4,49371	9694	3,98650,30154	4,47980
9665	3,98520,18584	4,49324	9695	3,98654,78134	4,47934
9666	3,98524,67908	4,49278	9696	3,98659,26068	4,47888
9667	3,98529,17186	4,49231	9697	3,98663,73956	4,47842
9668	3,98533,66417	4,49185	9698	3,98668,21798	4,47795
9669	3,98538,15602	4,49139	9699	3,98672,69593	4,47750
9670	3,98542,64741	4,49092	9700	3,98677,17343	4,47703
9671	3,98547,13833	4,49046	9701	3,98681,65046	4,47657
9672	3,98551,62879	4,48999	9702	3,98686,12703	4,47611
9673	3,98556,11878	4,48953	9703	3,98690,60314	4,47565
9674	3,98560,60831	4,48906	9704	3,98695,07879	4,47518
9675	3,98565,09737	4,48860	9705	3,98699,55397	4,47473
9676	3,98569,58597	4,48814	9706	3,98704,02870	4,47426
9677	3,98574,07411	4,48767	9707	3,98708,50296	4,47381
9678	3,98578,56178	4,48721	9708	3,98712,97677	4,47334
9679	3,98583,04899	4,48674	9709	3,98717,45011	4,47288
9680	3,98587,53573	4,48628	9710	3,98721,92299	4,47242
9681	3,98592,02201	4,48582	9711	3,98726,39541	4,47196
9682	3,98596,50783	4,48536	9712	3,98730,86737	4,47150
9683	3,98600,99319	4,48489	9713	3,98735,33887	4,47104
9684	3,98605,47808	4,48443	9714	3,98739,80991	4,47058
9685	3,98609,96251	4,48396	9715	3,98744,28049	4,47012
9686	3,98614,44647	4,48350	9716	3,98748,75061	4,46966
9687	3,98618,92997	4,48304	9717	3,98753,22027	4,46920
9688	3,98623,41301	4,48258	9718	3,98757,68947	4,46874
9689	3,98627,89559	4,48212	9719	3,98762,15821	4,46728
9690	3,98632,37771	4,48165	9720	3,98766,62649	4,46782

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
9721	3,98771,09431	4,46736	9751	3,98904,91564	4,45362
9722	3,98775,56167	4,46691	9752	3,98909,36926	4,45316
9723	3,98780,02858	4,46644	9753	3,98913,82242	4,45271
9724	3,98784,49502	4,46598	9754	3,98918,27513	4,45224
9725	3,98788,96100	4,46552	9755	3,98922,72737	4,45179
9726	3,98793,42652	4,46507	9756	3,98927,17916	4,45134
9727	3,98797,89159	4,46460	9757	3,98931,63050	4,45088
9728	3,98802,35619	4,46415	9758	3,98936,08138	4,45042
9729	3,98806,82034	4,46369	9759	3,98940,53180	4,44997
9730	3,98811,28403	4,46323	9760	3,98944,98177	4,44951
9731	3,98815,74726	4,46277	9761	3,98949,43128	4,44905
9732	3,98820,21003	4,46231	9762	3,98953,88033	4,44860
9733	3,98824,67234	4,46185	9763	3,98958,32893	4,44814
9734	3,98829,13419	4,46140	9764	3,98962,77707	4,44769
9735	3,98833,59559	4,46093	9765	3,98967,22476	4,44723
9736	3,98838,05652	4,46048	9766	3,98971,67199	4,44678
9737	3,98842,51700	4,46002	9767	3,98976,11877	4,44632
9738	3,98846,97702	4,45956	9768	3,98980,56509	4,44587
9739	3,98851,43658	4,45911	9769	3,98985,01096	4,44541
9740	3,98855,89569	4,45864	9770	3,98989,45637	4,44496
9741	3,98860,35433	4,45819	9771	3,98993,90133	4,44450
9742	3,98864,81252	4,45773	9772	3,98998,34583	4,44405
9743	3,98869,27025	4,45728	9773	3,99002,78988	4,44359
9744	3,98873,72753	4,45682	9774	3,99007,23347	4,44314
9745	3,98878,18435	4,45635	9775	3,99011,67661	4,44268
9746	3,98882,64070	4,45591	9776	3,99016,11929	4,44223
9747	3,98887,09661	4,45544	9777	3,99020,56152	4,44177
9748	3,98891,55205	4,45499	9778	3,99025,00329	4,44132
9749	3,98896,00704	4,45453	9779	3,99029,44461	4,44087
9750	3,98900,46157	4,45407	9780	3,99033,88548	4,44041

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
9781	3,99038,32589	4,43996	9811	3,99171,32757	4,42638
9782	3,99042,76585	4,43950	9812	3,99175,75395	4,42593
9783	3,99047,20535	4,43905	9813	3,99180,17988	4,42548
9784	3,99051,64440	4,43860	9814	3,99184,60536	4,42503
9785	3,99056,08300	4,43814	9815	3,99189,03039	4,42458
9786	3,99060,52114	4,43769	9816	3,99193,45497	4,42413
9787	3,99064,95883	4,43724	9817	3,99197,87910	4,42368
9788	3,99069,39607	4,43678	9818	3,99202,30278	4,42322
9789	3,99073,83285	4,43633	9819	3,99206,72600	4,42278
9790	3,99078,26918	4,43588	9820	3,99211,14878	4,42232
9791	3,99082,70506	4,43542	9821	3,99215,57110	4,42188
9792	3,99087,14048	4,43497	9822	3,99219,99298	4,42142
9793	3,99091,57545	4,43452	9823	3,99224,41440	4,42098
9794	3,99096,00997	4,43406	9824	3,99228,83538	4,42052
9795	3,99100,44403	4,43362	9825	3,99233,25590	4,42008
9796	3,99104,87765	4,43315	9826	3,99237,67598	4,41963
9797	3,99109,31080	4,43271	9827	3,99242,09561	4,91917
9798	3,99113,74351	4,43226	9828	3,99246,51478	4,41873
9799	3,99118,17577	4,43180	9829	3,99250,93351	4,41827
9800	3,99122,60757	4,43135	9830	3,99255,35178	4,41783
9801	3,99127,03892	4,43090	9831	3,99259,76961	4,41738
9802	3,99131,46982	4,43044	9832	3,99264,18699	4,41693
9803	3,99135,90026	4,43000	9833	3,99268,60392	4,41648
9804	3,99140,33026	4,42954	9834	3,99273,02040	4,41603
9805	3,99144,75980	4,42909	9835	3,99277,43643	4,41558
9806	3,99149,18889	4,42864	9836	3,99281,85201	4,41513
9807	3,99153,61753	4,42819	9837	3,99286,26714	4,41468
9808	3,99158,04572	4,42773	9838	3,99290,68182	4,41424
9809	3,99162,47345	4,42729	9839	3,99295,09606	4,41378
9810	3,99166,90074	4,42683	9840	3,99299,50984	4,41334

N.	Logarithmi	Differ.
9841	3,99303,92318	4,41289
9842	3,99308,33607	4,41244
9843	3,99312,74851	4,41199
9844	3,99317,16050	4,41155
9845	3,99321,57205	4,41109
9846	3,99325,98314	4,41065
9847	3,99330,39379	4,41020
9848	3,99334,80399	4,40975
9849	3,99339,21374	4,40931
9850	3,99343,62305	4,40886
9851	3,99348,03191	4,40841
9852	3,99352,44032	4,90796
9853	3,99356,84828	4,40751
9854	3,99361,25579	4,40707
9855	3,99365,66286	4,40662
9856	3,99370,06948	4,40618
9857	3,99374,47566	4,40572
9858	3,99378,88138	4,40528
9859	3,99383,28666	4,40483
9860	3,99387,69149	4,40439
9861	3,99392,09588	4,40394
9862	3,99396,49982	4,40349
9863	3,99400,90331	4,40305
9864	3,99405,30636	4,40260
9865	3,99409,70896	4,40215
9866	3,99414,11111	4,40171
9867	3,99418,51282	4,40126
9868	3,99422,91408	4,40082
9869	3,99427,31490	4,40037
9870	3,99431,71527	4,39992

N.	Logarithmi	Differ.
9871	3,99436,11519	4,39948
9872	3,99440,51467	4,39903
9873	3,99444,91370	4,39859
9874	3,99449,31229	4,39814
9875	3,99453,71043	4,39770
9876	3,99458,10813	4,39725
9877	3,99462,50538	4,39680
9878	3,99466,90218	4,39636
9879	3,99471,29854	4,39592
9880	3,99475,69446	4,39547
9881	3,99480,08993	4,39503
9882	3,99484,48496	4,39458
9883	3,99488,87954	4,39413
9884	3,99493,27367	4,39369
9885	3,99497,66736	4,34325
9886	3,99502,06061	4,39281
9887	3,99506,45342	4,39235
9888	3,99510,84577	4,39192
9889	3,99515,23769	4,39147
9890	3,99519,62916	4,39103
9891	3,99524,02019	4,39058
9892	3,99528,41077	4,39014
9893	3,99532,80091	4,38969
9894	3,99537,19060	4,38925
9895	3,99541,57985	4,38881
9896	3,99545,96866	4,38837
9897	3,99550,35703	4,38792
9898	3,99554,74495	4,38748
9899	3,99559,13243	4,38703
9900	3,99563,51946	4,38659

N.	Logarithmi	Differ.
9901	3,99567,90605	4,38615
9902	3,99572,29220	4,38570
9903	3,99576,67790	4,38527
9904	3,99581,06317	4,38482
9905	3,99585,44799	4,38437
9906	3,99589,83236	4,38394
9907	3,99594,21630	4,38349
9908	3,99598,59979	4,38305
9909	3,99602,98284	4,38261
9910	3,99607,36545	4,38216
9911	3,99611,74761	4,38173
9912	3,99616,12934	4,38128
9913	3,99620,51062	4,38084
9914	3,99624,89146	4,38039
9915	3,99629,27185	4,37996
9916	3,99633,65181	4,37951
9917	3,99638,03132	4,37908
9918	3,99642,41040	4,37863
9919	3,99646,78903	4,37819
9920	3,99651,16722	4,37774
9921	3,99655,54496	4,37731
9922	3,99659,92227	4,37687
9923	3,99664,29914	4,37642
9924	3,99668,67556	4,37598
9925	3,99673,05154	4,37555
9926	3,99677,42709	4,37510
9927	3,99681,80219	4,37466
9928	3,99686,17685	4,37422
9929	3,99690,55107	4,37378
9930	3,99694,92485	4,37334

N.	Logarithmi	Differ.
9931	3,99699,29819	4,37290
9932	3,99703,67109	4,37246
9933	3,99708,04355	4,37202
9934	3,99712,41557	4,37157
9935	3,99716,78714	4,37114
9936	3,99721,15828	4,37070
9937	3,99725,52898	4,37026
9938	3,99729,89924	4,36982
9939	3,99734,26906	4,36938
9940	3,99738,63844	4,36894
9941	3,99743,00738	4,36850
9942	3,99747,37588	4,36806
9943	3,99751,74394	4,36762
9944	3,99756,11156	4,36719
9945	3,99760,47875	4,36674
9946	3,99764,84549	4,36630
9947	3,99769,21179	4,36587
9948	3,99773,57766	4,36543
9949	3,99777,94309	4,36498
9950	3,99782,30807	4,36455
9951	3,99786,67262	4,36411
9952	3,99791,03673	4,36368
9953	3,99795,40041	4,36323
9954	3,99799,76364	4,36280
9955	3,99804,12644	4,36235
9956	3,99808,48879	4,36192
9957	3,99812,85071	4,36148
9958	3,99817,21219	4,36105
9959	3,99821,57324	4,36060
9960	3,99825,93384	4,3601[illegible]

N.	Logarithmi	Differ.	N.	Logarithmi	Differ.
9961	3,99830,29401	4,35973	9981	3,99917,40556	4,35099
9962	3,99834,65374	4,35929	9982	3,99921,75655	4,35056
9963	3,99839,01303	4,35886	9983	3,99926,10711	4,35012
9964	3,99843,37189	4,35841	9984	3,99930,45723	4,34969
9965	3,99847,73030	4,35798	9985	3,99934,80692	4,34925
9966	3,99852,08828	4,35755	9986	3,99939,15617	4,34882
9967	3,99856,44583	4,35710	9987	3,99943,50499	4,34838
9968	3,99860,80293	4,35667	9988	3,99947,85337	4,34794
9969	3,99865,15960	4,35623	9989	3,99952,20131	4,34751
9970	3,99869,51583	4,35580	9990	3,99956,54882	4,34708
9971	3,99873,87163	4,35535	9991	3,99960,89590	4,34664
9972	3,99878,22698	4,35492	9992	3,99965,24254	4,34620
9973	3,99882,58190	4,35449	9993	3,99969,58874	4,34577
9974	3,99886,93639	4,35405	9994	3,99973,93451	4,34534
9975	3,99891,29044	4,35361	9995	3,99978,27985	4,34490
9976	3,99895,64405	4,35317	9996	3,99982,62475	4,34446
9977	3,99899,99722	4,35274	9997	3,99986,96921	4,34403
9978	3,99904,34996	4,35230	9998	3,99991,31324	4,34360
9979	3,99908,70226	4,35187	9999	3,99995,65684	4,34316
9980	3,99913,05413	4,35143	10000	4,00000,00000	4,34273

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M	SINVS.	Sinus Compl.	TANG.	Tangens Compl.		Ar.compl. Sinus.	Ar.Com Sin.com
0	0	10,000000	0	Infinitum,	60	Infinitum,	,0000000
1	6,4637261	9,9999999	6,4637261	13,5362739	59	3,5362739	,000000
2	6,7647561	9,9999999	6,7647562	13,2352438	58	3,2352439	,0000001
3	6,9408473	9,9999998	6,9408475	13,0591525	57	3,0591527	,0000002
4	7,0657860	9,9999997	7,0657863	12,9342137	56	2,9342140	,000000
5	7,1626960	9,9999995	7,1626964	12,8373036	55	2,8373040	,000000
6	7,2418771	9,9999993	7,2418778	12,7581222	54	2,7581229	,000000
7	7,3088239	9,9999991	7,3088248	12,6911752	53	2,6911761	,000000
8	7,3668157	9,9999988	7,3668169	12,6331831	52	2,6331843	,000001
9	7,4179681	9,9999985	7,4179696	12,5820304	51	2,5820319	,000001
10	7,4637255	9,9999982	7,4637273	12,5362727	50	2,5362745	,000001
11	7,5051181	9,9999978	7,5051203	12,4948797	49	2,4948819	,000002
12	7,5429065	9,9999974	7,5429091	12,4570909	48	2,4570935	,000002
13	7,5776684	9,9999969	7,5776715	12,4223285	47	2,4223316	,000003
14	7,6098530	9,9999964	7,6098566	12,3901434	46	2,3901470	,000003
15	7,6398160	9,9999959	7,6398201	12,3601799	45	2,3601840	,000004
16	7,6678445	9,9999953	7,6678492	12,3321508	44	2,3321555	,00000
17	7,6941733	9,9999947	7,6941786	12,3058214	43	2,3058267	,00000
18	7,7189966	9,9999940	7,7190026	12,2809974	42	2,2810034	,00000
19	7,7424775	9,9999934	7,7424841	12,2575159	41	2,2575225	,00000
20	7,7647537	9,9999927	7,7647610	12,2352390	40	2,2352463	,000007
21	7,7859427	9,9999919	7,7859508	12,2140492	39	2,2140573	,000008
22	7,8061458	9,9999911	7,8061547	12,1938453	38	2,1938542	,00000
23	7,8254507	9,9999903	7,8254604	12,1745396	37	2,1745493	,00000
24	7,8439338	9,9999894	7,8439444	12,1560556	36	2,1560662	,000010
25	7,8616623	9,9999885	7,8616738	12,1383262	35	2,1383377	,00001
26	7,8786953	9,9999876	7,8787077	12'1212923	34	2,1213047	,00001
27	7,8950854	9,9999866	7,8950988	12,1049012	33	2,1049146	,00001
28	7,9108793	9,9999856	7,9108938	12,0891062	32	2,0891207	,00001
29	7,9261190	9,9999845	7,9261344	12,0738656	31	2,0738810	,00001
30	7,9408419	9,9999835	7,9408584	12,0591416	30	2,0591581	,00001
	Sinus. Compl.	SINVS.	Tangens Compl.	TANG.	M		

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SINVS.	Sinus Compl.	TANG.	Tangens Compl.		Ar.compl. Sinus.	Ar.Com. Sin. com.
7.9408419	9.9999835	7.9408584	12.0591416	30	2.0591581	.0000165
7.9550819	9.9999823	7.9550996	12.0449004	29	2.0449181	.0000177
7.9688698	9.9999812	7.9688886	12.0311114	28	2.0311302	.0000188
7.9822334	9.9999800	7.9822534	12.0177466	27	2.0177666	.0000200
7.9951980	9.9999788	7.9952192	12.0047808	26	2.0048020	.0000212
8.0077867	9.9999775	8.0078092	11.9921908	25	1.9922133	.0000225
8.0200207	9.9999762	8.0200445	11.9799555	24	1.9799793	.0000238
8.0319195	9.9999748	8.0319446	11.9680554	23	1.9680805	.0000252
8.0435009	9.9999735	8.0435274	11.9564726	22	1.9564991	.0000265
8.0547814	9.9999721	8.0548193	11.9451806	21	1.9452186	.0000279
8.0657763	9.9999706	8.0658057	11.9341943	20	1.9342237	.0000294
8.0764997	9.9999691	8.0765306	11.9234694	19	1.9235003	.0000309
8.0869646	9.9999676	8.0869970	11.9130030	18	1.9130354	.0000324
8.0971832	9.9999660	8.0972172	11.9027828	17	1.9028168	.0000340
8.1071669	9.9999644	8.1072025	11.8927975	16	1.8928331	.0000356
8.1169262	9.9999628	8.1169634	11.8830366	15	1.8830738	.0000372
8.1264710	9.9999611	8.1265099	11.8734901	14	1.8735290	.0000389
8.1358104	9.9999594	8.1358510	11.8641490	13	1.8641896	.0000406
8.1449532	9.9999577	8.1449956	11.8550044	12	1.8550468	.0000423
8.1539075	9.9999559	8.1539516	11.8460484	11	1.8460925	.0000441
8.1626808	9.9999541	8.1627367	11.8372633	10	1.8373192	.0000459
8.1712804	9.9999522	8.1713282	11.8286718	9	1.8287196	.0000478
8.1797129	9.9999503	8.1797626	11.8202374	8	1.8202871	.0000497
8.1879848	9.9999484	8.1880364	11.8119636	7	1.8120152	.0000516
8.1961020	9.9999464	8.1961556	11.8038444	6	1.8038980	.0000536
8.2040703	9.9999444	8.2041259	11.7958741	5	1.7959297	.0000556
8.2118949	9.9999424	8.2119526	11.7880474	4	1.7881051	.0000576
8.2195811	9.9999403	8.2196408	11.7803592	3	1.7804189	.0000597
8.2271335	9.9999382	8.2271953	11.7728047	2	1.7728665	.0000618
8.2345568	9.9999360	8.2346208	11.7653792	1	1.7654432	.0000640
8.2418553	9.9999338	8.2419215	11.7580785	0	1.7581447	.0000662
Sinus Compl.	SINVS.	Tangens Compl.	TANG.	M		

1 grad.

M	SINVS.	Sinus Compl.	TANG.	Tangens Compl.		Ar.compl. Sinuus.	Ar.Com Sin.com.
0	8,2418553	9.9999338	8,2419215	11.7580785	60	1.7581447	,0000662
1	8,2490332	9.9999316	8,2491015	11,7508985	59	1.7509668	,0000684
2	8,2560943	9.9999294	8,2561649	11.7438351	58	1.7439057	,0000706
3	8,2630424	9.9999271	8,2631153	11,7368847	57	1.7369576	,0000729
4	8,2698810	9.9999247	8,2699563	11.7300437	56	1.7301190	,0000753
5	8,2766136	9.9999224	8,2766912	11,7233088	55	1.7233864	,0000776
6	8,2832434	9.9999200	8,2833234	11,7166766	54	1,7167566	,0000800
7	8,2897734	9.9999175	8,2898559	11,7101441	53	1,7102266	,0000825
8	8,2962067	9.9999150	8,2962917	11,7037083	52	1,7037933	,0000850
9	8,3025460	9.9999125	8,3026335	11,6973665	51	1,6974540	,0000875
10	8,3087941	9.9999100	8,3088842	11,6911158	50	1,6912059	,0000900
11	8,3149536	9.9999074	8,3150462	11,6849538	49	1,6850464	,0000926
12	8,3210269	9.9999047	8,3211221	11,6788779	48	1,6789731	,0000953
13	8,3270163	9.9999021	8,3271143	11,6728857	47	1,6729837	,0000979
14	8,3329243	9.9998994	8,3330249	11,6669751	46	1,6670757	,0001006
15	8,3387529	9.9998966	8,3388563	11,6611437	45	1,6612471	,0001034
16	8,3445043	9.9998939	8,3446105	11,6553895	44	1,6554957	,0001061
17	8,3501805	9.9998911	8,3502895	11,6497105	43	1,6498195	,0001089
18	8,3557835	9.9998882	8,3558953	11,6441047	42	1,6442165	,0001118
19	8,3613150	9.9998853	8,3614297	11,6385703	41	1,6386850	,0001147
20	8,3667769	9.9998824	8,3668945	11,6331055	40	1,6332231	,0001176
21	8,3721710	9.9998794	8,3722915	11,6277085	39	1,6278290	,000120
22	8,3774988	9.9998764	8,3776223	11,6223777	38	1,6225012	,000123
23	8,3827620	9.9998734	8,3828886	11,6171114	37	1,6172380	,000126
24	8,3879622	9.9998703	8,3880918	11,6119082	36	1,6120378	,000129
25	8,3931008	9.9998672	8,3932336	11,6067664	35	1,6068992	,000132
26	8,3981793	9.9998641	8,3983152	11,6016848	34	1,6018207	,000135
27	8,4031990	9.9998609	8,4033381	11,5966619	33	1,5968010	,000139
28	8,4081614	9.9998577	8,4083037	11,5916963	32	1,5918386	,00014
29	8,4130676	9.9998544	8,4132132	11,5867868	31	1,5869324	,00014
30	8,4179190	9.9998512	8,4180679	11,5819321	30	1,5820810	,00014
	Sinus. Compl.	SINVS.	Tangens Compl.	TANG.	M		

88 grad.

1 grad.

SINVS.	Sinus Compl.	TANG.	Tangens, Compl.		Ar.compl. Sinus.	Ar.Com, Sin. com.
8.4179190	9.9998512	8.4180679	11.5819321	30	1.5820810	,0001488
8.4227168	9.9998478	8.4228690	11.5771310	29	1.5772832	,0001522
8.4274621	9.9998445	8.4276176	11.5723824	28	1.5725379	,0001555
8.4321561	9.9998411	8.4323150	11.5676850	27	1.5678439	,0001589
8.4367999	9.9998376	8.4369622	11.5630378	26	1.5632001	,0001624
8.4413944	9.9998342	8.4415603	11.5584397	25	1.5586056	,0001658
8.4459409	9.9998306	8.4461103	11.5538897	24	1.5540591	,0001694
8.4504402	9.9998271	8.4506131	11.5493869	23	1.5495598	,0001729
8.4548934	9.9998235	8.4550699	11.5449301	22	1.5451066	,0001765
8.4593013	9.9998199	8.4594814	11.5405186	21	1.5406987	,0001801
8.4636649	9.9998162	8.4638486	11.5361514	20	1.5363351	,0001838
8.4679850	9.9998125	8.4681725	11.5318275	19	1.5320150	,0001875
8.4722626	9.9998088	8.4724538	11.5275462	18	1.5277374	,0001912
8.4764984	9.9998050	8.4766933	11.5233067	17	1.5235016	,0001950
8.4806932	9.9998012	8.4808920	11.5191080	16	1.5193068	,0001988
8.4848479	9.9997974	8.4850505	11.5149495	15	1.5151521	,0002026
8.4889632	9.9997935	8.4891696	11.5108304	14	1.5110368	,0002065
8.4930398	9.9997896	8.4932502	11.5067498	13	1.5069602	,0002104
8.4970784	9.9997856	8.4972928	11.5027072	12	1.5029216	,0002144
8.5010798	9.9997817	8.5012982	11.4987018	11	1.4989202	,0002183
8.5050447	9.9997776	8.5052671	11.4947329	10	1.4949553	,0002224
8.5089736	9.9997736	8.5092001	11.4907999	9	1.4910264	,0002264
8.5128673	9.9997695	8.5130978	11.4869022	8	1.4871327	,0002305
8.5167264	9.9997653	8.5169610	11.4830387	7	1.4832736	,0002347
8.5205514	9.9997612	8.5207902	11.4792098	6	1.4794486	,0002388
8.5243430	9.9997570	8.5245860	11.4754140	5	1.4756570	,0002430
8.5281017	9.9997527	8.5283490	11.4716510	4	1.4718983	,0002473
8.5318281	9.9997484	8.5320797	11.4679203	3	1.4681719	,0002516
8.5355228	9.9997441	8.5357787	11.4642213	2	1.4644772	,0002559
8.5391863	9.9997398	8.5394466	11.4605534	1	1.4508137	,0002602
8.5428192	9.9997354	8.5430838	11.4569162	0	1.4571808	,0002646
Sinus Compl.	SINVS.	Tangens Compl.	TANG.	M		

88 grad.

2 grad.

M	SINVS.	Sinus Compl.	TANG.	Tangens Compl.		Ar.compl. Sinus.	Ar.com Sin.com
0	8,5428192	9,9997354	8,5430838	11,4569162	60	1,4571808	,000264
1	8,5464218	9,9997309	8,5466909	11,4533091	59	1,4535782	,000269
2	8,5499948	9,9997265	8,5502683	11,4497317	58	1,4500052	,000273
3	8,5535386	9,9997220	8,5538166	11,4461834	57	1,4464614	,000278
4	8,5570536	9,9997174	8,5573362	11,4426638	56	1,4429464	,00028
5	8,5605404	9,9997128	8,5608276	11,4391724	55	1,4394596	,00028
6	8,5639994	9,9997082	8,5642912	11,4357088	54	1,4360006	,000291
7	8,5674310	9,9997036	8,4677275	11,4322725	53	1,4325690	,000226
8	8,5708357	9,9996989	8,5711368	11,4288632	52	1,4291643	,000301
9	8,5742139	9,9996942	8,5745197	11,4254803	51	1,4257861	,00030
10	8,5775660	9,9996894	8,5778766	11,4221234	50	1,4224340	,000310
11	8,5808923	9,9996846	8,5812077	11,4187923	49	1,4191077	,00031
12	8,5841933	9,9996798	8,5845136	11,4154864	48	1,4158067	,000320
13	8,5874694	9,9996749	8,5877945	11,4122055	47	1,4125306	,00032
14	8,5907209	9,9996700	8,5910509	11,4089491	46	1,4092791	,000330
15	8,5939483	9,9996650	8,5942832	11,4057168	45	1,4060517	,00033
16	8,5971517	9,9996601	8,5974917	11,4025083	44	1,4028483	,00033
17	8,6003317	9,9996550	8,6006767	11,3993233	43	1,3996683	,00034
18	8,6034886	9,9996500	8,6038386	11,3961614	42	1,3965114	,00035
19	8,6066226	9,9996449	8,6069777	11,3930223	41	1,3933774	,00035
20	8,6097341	9,9996398	8,6100943	11,3899057	40	1,3902659	,00036
21	8,6128235	9,9996346	8,6131889	11,3868111	39	1,3871765	,00036
22	8,6158910	9,9996294	8,6162616	11,3837384	38	1,3841090	,00037
23	8,6189369	9,9996242	8,6193127	11,3806873	37	1,3810631	,00037
24	8,6219616	9,9996189	8,6223427	11,3776573	36	1,3780384	,00038
25	8,6249653	9,9996136	8,6253518	11,3746482	35	1,3750347	,00038
26	8,6279484	9,9996082	8,6283402	11,3716598	34	1,3720516	,00039
27	8,6309111	9,9996028	8,6313083	11,3686917	33	1,3690889	,00039
28	8,6338537	9,9995974	8,6342563	11,3657437	32	1,3661463	,0004
29	8,6367764	9,9995919	8,6371845	11,3628155	31	1,3632236	,0004
30	8,6396796	9,9995865	8,6400931	11,3599069	30	1,3603204	,0004
	Sinus. Compl.	SINVS.	Tangens Compl.	TANG.	M		

87 grad.

2 grad.

SINVS.	Sinus Compl.	TANG.	Tangens Compl.		Ar. compl. Sinus.	Ar. Com. Sin. com.
8,6396796	9,9995865	8,6400931	11,3599069	30	1,3603204	,0004135
8,6425634	9,9995809	8,6429825	11,3570175	29	1,3574366	,0004191
8,6454282	9,9995753	8,6458528	11,3541472	28	1,3545718	,0004247
8,6482742	9,9995697	8,6487044	11,3512956	27	1,3517258	,0004303
8,6511016	9,9995641	8,6515375	11,3484625	26	1,3488984	,0004359
8,6539107	9,9995584	8,6543522	11,3456478	25	1,3460893	,0004416
8,6567017	9,9995527	8,6571490	11,3428510	24	1,3432983	,0004473
8,6594748	9,9995469	8,6599279	11,3400721	23	1,3405252	,0004531
8,6622303	9,9995411	8,6626891	11,3373109	22	1,3377697	,0004589
8,6649684	9,9995353	8,6654331	11,3345669	21	1,3350316	,0004647
8,6676893	9,9995295	8,6681598	11,3318401	20	1,3323107	,0004705
8,6703932	9,9995236	8,6708697	11,3291303	19	1,3296068	,0004764
8,6730804	9,9995176	8,6735628	11,3264372	18	1,3269196	,0004824
8,6757510	9,9995116	8,6762393	11,3237607	17	1,3242490	,0004884
8,6784052	9,9995056	8,6788996	11,3211004	16	1,3215948	,0004944
8,6810433	9,9994996	8,6815437	11,3184563	15	1,3189567	,0005004
8,6836654	9,9994935	8,6841719	11,3158281	14	1,3163346	,0005065
8,6862718	9,9994874	8,6867844	11,3132156	13	1,3137282	,0005126
8,6888625	9,9994812	8,6893813	11,3106187	12	1,3111375	,0005188
8,6914379	9,9994750	8,6919629	11,3080371	11	1,3085621	,0005250
8,6939980	9,9994688	8,6945292	11,3054708	10	1,3060019	,0005312
8,6965431	9,9994625	8,6970806	11,3029194	9	1,3034569	,0005375
8,6990734	9,9994562	8,6996172	11,3003828	8	1,3009266	,0005438
8,7015889	9,9994498	8,7021390	11,2978610	7	1,2984111	,0005502
8,7040899	9,9994435	8,7046465	11,2953535	6	1,2959101	,0005565
8,7065766	9,9994370	8,7071395	11,2928605	5	1,2934234	,0005630
8,7090490	9,9994306	8,7096185	11,2903815	4	1,2909510	,0005694
8,7115075	9,9994241	8,7120834	11,2879166	3	1,2884925	,0005759
8,7139520	9,9994176	8,7145345	11,2854655	2	1,2860480	,0005824
8,7163829	9,9994110	8,7169719	11,2830281	1	1,2836171	,0005890
8,7188002	9,9994044	8,7193958	11,2806042	0	1,2811998	,0005956
Sinus. Compl.	SINVS.	Tangens Compl.	TANG.	M		

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M	SINVS.	Sinus Compl.	TANG.	Tangens Compl.		Ar.compl. Sinus.	Ar. com. Sin.com.
0	8.7188002	9.9994044	8.7193958	11.2806042	60	1.2811998	,0005956
1	8.7212040	9.9993978	8.7218063	11.2781937	59	1.2787960	,000602
2	8.7235946	9.9993911	8.7242035	11.2757965	58	1.2764054	,000608
3	8.7259721	9.9993844	8.7265877	11.2734123	57	1.2740279	,000615
4	8.7283366	9.9993776	8.7289589	11.2710411	56	1.2716634	,000622
5	8.7306882	9.9993708	8.7313174	11.2686826	55	1.2693118	,000629
6	8.7330272	9.9993640	8.7336631	11.2663369	54	1.2669728	,000636
7	8.7353535	9.9993572	8.7359964	11.2640036	53	1.2646465	,000642
8	8.7376675	9.9993503	8.7383172	11.2616828	52	1.2623325	,000649
9	8.7399691	9.9993433	8.7406258	11.2593742	51	1.2600309	,000656
10	8.7422586	9.9993364	8.7429222	11.2570778	50	1.2577414	,000663
11	8.7445360	9.9993293	8.7452067	11.2547933	49	1.2554640	,000670
12	8.7468015	9.9993223	8.7474792	11.2525208	48	1.2531985	,000677
13	8.7490553	9.9993152	8.7497400	11.2502600	47	1.2509447	,000684
14	8.7512973	9.9993081	8.7519892	11.2480108	46	1.2487027	,000691
15	8.7535278	9.9993009	8.7542269	11.2457731	45	1.2464722	,000699
16	8.7557469	9.9992938	8.7564531	11.2435469	74	1.2442531	,000706
17	8.7579546	9.9992865	8.7586681	11.2413319	43	1.2420454	,000713
18	8.7601512	9.9992793	8.7608719	11.2391281	42	1.2398488	,000720
19	8.7623366	9.9992720	8.7630647	11.2369353	41	1.2376634	,000728
20	8.7645111	9.9992646	8.7652465	11.2347535	40	1.2354889	,000735
21	8.7666747	9.9992572	8.7674175	11.2325825	39	1.2333253	,000742
22	8.7688275	9.9992498	8.7695777	11.2304223	38	1.2311725	,000750
23	8.7709697	9.9992424	8.7717274	11.2282726	37	1.2290303	,000757
24	8.7731014	9.9992349	8.7738665	11.2261335	36	1.2268986	,000765
25	8.7752226	9.9992274	8.7759952	11.2240048	35	1.2247774	,000772
26	8.7773334	9.9992198	8.7781136	11.2218864	34	1.2226666	,000780
47	8.7794340	9.9992122	8.7802218	11.2197782	33	1.2205660	,000787
48	8.7815244	9.9992046	8.7823199	11.2176801	32	1.2184756	,000795
29	8.7836048	9.9991969	8.7844079	11.2155921	31	1.2163952	,000803
30	8.7856753	9.9991892	8.7864861	11.2135139	30	1.2143247	,000810
	Sinus. Compl.	SINVS.	Tangens Compl.	TANG.	M		

SINVS.	Sinus Compl.	TANG.	Tangens Compl.		Ar.compl. Sinus.	Ar.Com. Sin.com.
8,7856753	9,9991892	8,7864861	11,2135139	30	1,2143247	,0008108
8,7877359	9,9991815	8,7885544	11,2114456	29	1,2122641	,0008185
8,7897867	9,9991737	8,7906130	11,2093870	28	1,2102133	,0008263
8,7918278	9,9991659	8,7926620	11,2073380	27	1,2081722	,0008341
8,7938594	9,9991580	8,7947014	11,2052986	26	1,2061406	,0008420
8,7958814	9,9991501	8,7967313	11,2032687	25	1,2041186	,0008499
8,7978941	9,9991422	8,7987519	11,2012481	24	1,2021059	,0008578
8,7998974	9,9991342	8,8007632	11,1992368	23	1,2901026	,0008658
8,8018915	9,9991262	8,8027653	11,1972347	22	1,1981085	,0008738
8,8038764	9,9991182	8,8047583	11,1952417	21	1,1961236	,0008818
8,8058523	9,9991101	8,8067422	11,1932578	20	1,1941477	,0008899
8,8078192	9,9991020	8'8087172	11,1912828	19	1,1921808	,0008980
8,8097772	9,9990938	8,8106834	11,1893166	18	1,1902228	,0009062
8,8117264	9,9990856	8,8126407	11,1873593	17	1,1882736	,0009144
8,8136668	9,9990774	8,8145894	11,1854106	16	1,1863332	,0009226
8,8155985	9,9990691	8,8165294	11,1834706	15	1,1844015	,0009309
8,8175217	9,9990608	8,8184608	11,1815392	14	1,1824783	,0009392
8,8194363	9,9990525	8,8203838	11,1796162	13	1,1805637	,0009475
8,8213425	9,9990441	8,8222984	11,1777016	12	1,1786575	,0009559
8,8232404	9,9990357	8,8242046	11,1757954	11	1,1767596	,0009643
8,8251299	9,9990273	8,8261026	11,1738974	10	1,1748701	,0009727
8,8270112	9,9990188	8,8279924	11,1720076	9	1,1729888	,0009812
8,8288844	9,9990103	8,8298741	11,1701259	8	1,1711156	,0009897
8,8307495	9,9990017	8,8317478	11,1682522	7	1,1692505	,0009983
8,8326066	9,9989931	8,8336134	11,1663866	6	1,1673934	,0010069
8,8344557	9,9989845	8,8354712	11,1645288	5	1,1655443	,0010155
8,8362969	9,9989758	8,8373211	11,1626789	4	1,1637031	,0010242
8,8381304	9,9989671	8,8391633	11,1608367	3	1,1618696	,0010329
8,8399561	9,9989584	8,8409977	11,1590023	2	1,1600439	,0010416
8,8417741	9,9989496	8,8428245	11,1571755	1	1,1582259	,0010504
8,8435845	9,9989408	8,8446437	11,1553563	0	1,1564155	,0010592
Sinus. Compl.	SINVS.	Tangens Compl.	TANG.	M		

M	SINVS.	Sinus. Compl.	TANG.	Tangens Compl.		Ar.compl. Sinus.	Ar.com Sin.com
0	8,8435845	9.9989408	8,8446437	11,1553563	60	1.1564155	,0010592
1	8,8453874	9.9989319	8,8464554	11,1535446	59	1.1546126	,0010681
2	8,8471827	9.9989230	8,8482597	11,1517403	58	1.1528173	,0010770
3	8,8489707	9.9989141	8,8500566	11,1499434	57	1.1510293	,0010859
4	8,8507512	9.9989052	8,8518461	11,1481539	56	1.1492488	,0010948
5	8,8525245	9.9988962	8,8536283	11,1463717	55	1.1474755	,0011038
6	8,8542905	9.9988871	8,8554034	11,1445966	54	1.1457095	,0011129
7	8,8560493	9.9988780	8,8571713	11,1428287	53	1.1439507	,0011220
8	8,8578010	9.9988689	8,8589321	11,1410679	52	1.1421990	,0011311
9	8,8595457	9.9988598	8,8606859	11,1393141	51	1.1404543	,0011402
10	8,8612833	9.9988506	8,8624327	11,1375673	50	1.1387167	,0011494
11	8,8630139	9.9988414	8,8641725	11,1358275	49	1.1369861	,0011586
12	8,8647376	9.9988321	8,8659055	11,1340945	48	1.1352624	,0011679
13	8,8664545	9.9988228	8,8676317	11,1323683	47	1.1335455	,0011772
14	8,8681646	9.9988135	8,8693511	11,1306489	46	1.1318354	,0011865
15	8,8698680	9.9988041	8,8710638	11,1289362	45	1.1301320	,0011959
16	8,8715646	9.9987947	8,8727699	11,1272301	44	1.1284354	,0012053
17	8,8732546	9.9987853	8,8744694	11,1255306	43	1.1267454	,0012147
18	8,8749381	9.9987758	8,8761623	11,1238377	42	1.1250619	,0012242
19	8,8766150	9.9987663	8,8778487	11,1221513	41	1.1233850	,0012337
20	8,8782854	9.9987567	8,8795286	11,1204714	40	1.1217146	,0012433
21	8,8799493	9.9987471	8,8812022	11,1187978	39	1.1200507	,0012529
22	8,8816069	9.9987375	8,8828694	11,1171306	38	1.1183931	,0012625
23	8,8832581	9.9987278	8,8845303	11,1154697	37	1.1167419	,0012722
24	8,8849031	9.9987181	8,8861850	11,1138150	36	1.1150969	,0012819
25	8,8865418	9'9987084	8,8878334	11,1121666	35	1.1134582	,0012916
26	8,8881743	9.9986986	8,8894757	11,1105243	34	1.1118257	,0013014
27	8,8898007	9.9986888	8,8911119	11,1088881	33	1.1101993	,0013112
28	8,8914209	9.9986790	8,8927420	11,1072580	32	1.1085791	,0013210
29	8,8930351	9.9986691	8,8943660	11,1056340	31	1.1069649	,0013309
30	8,8946433	9.9986591	8,8959842	11,1040158	30	1.1053567	,0013409
	Sinus Compl.	SINVS.	Tangens Compl.	TANG.	M		

4 grad.

SINVS.	Sinus. Compl.	TANG.	Tangens Compl.		Ar. compl. Sinus.	Ar. com. Sin. com.
8,8946433	9,9986591	8,8959842	11,1040158	30	1,1053567	,0013409
8,8962455	9,9986492	8,8975963	11,1024037	29	1,1037545	,0013508
8,8978418	9,9986392	8,8992026	11,1007974	28	1,1021582	,0013608
8,8994322	9,9986292	8,9008030	11,0991970	27	1,1005678	,0013708
8,9010168	9,9986191	8,9023977	11,0976023	26	1,0989832	,0013809
8,9025955	9,9986090	8,9039866	11,0960134	25	1,0974045	,0013910
8,9041685	9,9985988	8,9055697	11,0944303	24	1,0958315	,0014012
8,9057358	9,9985886	8,9071472	11,0928528	23	1,0942642	,0014114
8,9072975	9,9985784	8,9087190	11,0812810	22	1,0927025	,0014216
8,9088535	9,9985682	8,9102853	11,0897147	21	1,0911465	,0014318
8,9104039	9,9985579	8,9118460	11,0881540	20	1,0895961	,0014421
8,9119478	9,9985475	8,9134012	11,0865988	19	1,0880513	,0014525
8,9134880	9,9985372	8,9149509	11,0850491	18	1,0865119	,0014628
8,9150219	9,9985268	8,9164952	11,0835048	17	1,0849781	,0014732
8,9165504	9,9985163	8,9180340	11,0819660	16	1,0834496	,0014837
8,9180734	9,9985058	8,9195675	11,0804325	15	1,0819266	,0014942
8,9195911	9,9984953	8,9210957	11,0789043	14	1,0804089	,0015047
8,9211034	9,9984848	8,9226186	11,0773814	13	1,0788966	,0015152
8,9226105	9,9984742	8,9241393	11,0758637	12	1,0773895	,0015258
8,9241123	9,9984636	8,9256487	11,0743513	11	1,0758877	,0015364
8,9256089	9,9984529	8,9271560	11,0728440	10	1,0743911	,0015471
8,9271003	9,9984422	8,9286581	11,0713419	9	1,0728997	,0015578
8,9285866	9,9984315	8,9301552	11,0698448	8	1,0714134	,0015685
8,9300678	9,9984207	8,9316471	11,0683529	7	1,0699322	,0015793
8,9315439	9,9984099	8,9331340	11,0668660	6	1,0684561	,0015901
8,9330150	9,9983990	8,9346160	11,0653840	5	1,0669850	,0016010
8,9344811	9,9983881	8,9360929	11,0639071	4	1,0655189	,0016119
8,9359422	9,9983772	8,9375650	11,0624350	3	1,0640578	,0016228
8,9373983	9,9983663	8,9390321	11,0609679	2	1,0626017	,0016337
8,9388496	9,9983553	8,9404944	11,0595056	1	1,0611504	,0016447
8,9402960	9,9983442	8,9419518	11,0580482	0	1,0597040	,0016558
Sinus, Compl.	SINVS.	Tangens Comple.	TANG	M		

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M	SINVS.	Sinus. Compl.	TANG.	Tangens Compl.		Ar.compl. Sinus.	Ar.com. Sin.com.
0	8,9402960	9,9983442	8,9419518	11,0580482	60	1,0597040	,0016558
1	8,9417376	9,9983331	8,9434044	11,0565956	59	1,0582624	,0016669
2	8,9431743	9,9983220	8,9448523	11,0551477	58	1,0568257	,0016780
3	8,9446063	9,9983109	8,9462954	11,0537046	57	1,0553937	,0016891
4	8,9460335	9,9982997	8,9477338	11,0522662	56	1,0536965	,0017003
5	8,9474561	9,9982885	8,9491676	11,0508324	55	1,0525439	,0017115
6	8,9488739	9,9982772	8,9505967	11,0494033	54	1,0511261	,0017228
7	8,9502871	9,9982660	8,9520211	11,0479789	53	1,0497129	,0017340
8	8,9516957	9,9982546	8,9534410	11,0465590	52	1,0483043	,0017454
9	8,9530996	9,9982433	8,9548564	11,0451436	51	1,0469004	,0017567
10	8,9544991	9,9982318	8,9562672	11,0437328	50	1,0455009	,0017682
11	8,9558940	9,9982204	8,9576735	11,0423265	49	1,0441060	,0017796
12	8,9572843	9,9982089	8,9590754	11,0409246	48	1,0427157	,0017911
13	8,9586703	9,9981974	8,9604728	11,0395272	47	1,0413297	,0018026
14	8,9600517	9,9981859	8,9618659	11,0381341	46	1,0399483	,0018141
15	8,9614288	9,9981743	8,9632545	11,0367455	45	1,0385712	,0018257
16	8,9628014	9,9981626	8,9646388	11,0353612	44	1,0371986	,0018374
17	8,9641697	9,9981510	8,9660188	11,0339812	43	1,0358303	,0018490
18	8,9655337	9,9981393	8,9673944	11,0326056	42	1,0344663	,0018607
19	8,9668934	9,9981275	8,9687658	11,0312342	41	1,0331066	,0018725
20	8,9682487	9,9981158	8,9701330	11,0298670	40	1,0317513	,0018842
21	8,9695999	9,9981040	8,9714959	11,0285041	39	1,0304001	,0018960
22	8,9709468	9,9980921	8,9728547	11,0271453	38	1,0290532	,0019079
23	8,9722895	9,9980802	8,9742092	11,0257908	37	1,0277105	,0019198
24	8,9736280	9,9980683	8,9755597	11,0244403	36	1,0263720	,0019317
25	8,9749624	9,9980563	8,9769060	11,0230940	35	1,0250376	,0019437
26	8,9762926	9,9980443	8,9782483	11,0217517	34	1,0237074	,0019557
27	8,9776188	9,9980323	8,9795865	11,0204135	33	1,0223812	,0019677
28	8,9789408	9,9980202	8,9809206	11,0190794	32	1,0210592	,0019798
29	8,9802589	9,9980081	8,9822507	11,0177493	31	1,0197411	,0019919
30	8,9815729	9,9979960	8,9835769	11,0164231	30	1,0184271	,0020040
	Sinus Compl.	SINVS.	Tangens Compl.	TANG.	M		

SINVS.	Sinus. Compl.	TANG.	Tangens Compl.		Ar.compl. Sinus.	Ar. com. Sin.com.
8,9815729	9.9979960	8,9835769	11,0164231	30	1,0184271	,0020040
8,9828829	9.9979838	8,9848991	11,0151009	29	1,0171171	,0020162
8,9841889	9.9979716	8,9862173	11,0137827	28	1,0158111	,0020284
8,9854910	9.9979593	8,9875317	11,0124683	27	1,0145090	,0020407
8,9867891	9.9979470	8,9888421	11,0111579	26	1,0132109	,0020530
8,9880834	9.9979347	8,9901487	11,0098513	25	1,0119166	,0020653
8,9893737	9.9979223	8,9914514	11,0085486	24	1,0106263	,0020777
8,9906602	9.9979099	8,9927503	11,0072497	23	1,0093398	,0020901
8,9919429	9.9978975	8,9940454	11,0059546	22	1,0080571	,0021025
8,9932217	9.9978850	8,9953367	11,0046633	21	1,0067783	,0021150
8,9944968	9.9978725	8,9966243	11,0033757	20	1,0055032	,0021275
8,9957681	9.9978599	8,9979081	11,0020919	19	1,0042319	,0021401
8,9970356	9.9978473	8,9991883	11,0008117	18	1,0029644	,0021527
8,9982994	9.9978347	9.0004647	10,9995353	17	1,0017006	,0021653
8,9995595	9.9978220	9.0017375	10,9982625	16	1,0004405	,0021780
9,0008160	9.9978093	9.0030066	10,9969934	15	,9991840	,0021907
9,0020687	9.9977966	9.0042721	10,9957279	14	,9979313	,0022034
9,0033179	9.9977838	9.0055340	10,9944660	13	,9966821	,0022162
9,0045634	9.9977710	9.0067924	10,9932076	12	,9954366	,0022290
9,0058053	9.9977582	9.0080471	10,9919529	11	,9941947	,0022418
9,0070436	9.9977453	9.0092984	10,9907016	10	,9929564	,0022547
9,0082784	9.9977323	9.0105461	10,9894539	9	,9917216	,0022677
9,0095096	9.9977194	9.0117903	10,9882097	8	,9904904	,0022806
9,0107374	9.9977064	9.0130310	10,9869690	7	,9892626	,0022936
9,0119616	9.9976933	9.0142682	10,9857318	6	,9880384	,0023067
9,0131823	9.9976803	9.0155021	10,9844979	5	,9868177	,0023197
9,0143996	9.9976672	9.0167325	10,9832675	4	,9856004	,0023328
9,0156135	9.9976540	9.0179594	10,9820406	3	,9843865	,0023460
9,0168239	9.9976408	9.0191831	10,9808169	2	,9831761	,0023592
9,0180309	9.9976276	9.0204033	10,9795967	1	,9819691	,0023724
9,0192346	9.9976143	9.0216202	10,9783798	0	,9807654	,0023857
Sinus. Compl.	SINVS.	Tangens Comple.	TANG.	M		

6 grad.

M	SINVS.	Sinus. Compl.	TANG.	Tangens. Compl.		Ar.com. Sinus.	Ar. com. Sin.com.
0	9.0192346	9.9976143	9.0216202	10.9783798	60	.9807654	,0023857
1	9.0204348	9.9976011	9.0228338	10.9771662	59	.9795652	,0023989
2	9.0216318	9.9975877	9.0240441	10.9759559	58	.9783682	,0024123
3	9.0228254	9.9975743	9.0252510	10.9747490	57	.9771746	,0024257
4	9.0240157	9.9975609	9.0264548	10.9735452	56	.9759843	,002439
5	9.0252027	9.9975475	9.0276552	10.9723448	55	.9747973	,002452
6	9.0263865	9.9975340	9.0288524	10.9711476	54	.9736135	,0024660
7	9.0275669	9.9975205	9.0300464	10.9699536	53	.9724331	,0024795
8	9.0287442	9.9975069	9.0312373	10.9687627	52	.9712558	,0024931
9	9.0299182	9.9974933	9.0324249	10.9675751	51	.9700818	,0025067
10	9.0310890	9.9974797	9.0336093	10.9663907	50	.9689110	,0025203
11	9.0322567	9.9974660	9.0347906	10.9652094	49	.9677433	,0025340
12	9.0334212	9.9974523	9.0359688	10.9640312	48	.9665788	,0025477
13	9.0345825	9.9974386	9.0371439	10.9628561	47	.9654175	,0025614
14	9.0357407	9.9974248	9.0383159	10.9616841	46	.9642593	,0025752
15	9.0368958	9.9974110	9.0394848	10.9605152	45	.9631042	,0025890
16	9.0380477	9.9973971	9.0406506	10.9593494	44	.9619523	,0026029
17	9.0391966	9.9973832	9.0418134	10.9581866	43	.9608034	,0026167
18	9.0403424	9.9973693	9.0429731	10.9570269	42	.9596576	,0026307
19	9.0414852	9.9973554	9.0441299	10.9558701	41	.9585148	,0026446
20	9.0426249	9.9973414	9.0452836	10.9547164	40	.9573751	,0026586
21	9.0437617	9.9973273	9.0464343	10.9535657	39	.9562383	,0026727
22	9.0448954	9.9973132	9.0475821	10.9524179	38	.9551046	,0026868
23	9.0460261	9.9972991	9.0487270	10.9512730	37	.9539739	,0027009
24	9.0471538	9.9972850	9.0498689	10.9501311	36	.9528462	,0027150
25	9.0482786	9.9972708	9.0510078	10.9489922	35	.9517214	,0027292
26	9.0494005	9.9972566	9.0521439	10.9478561	34	.9505995	,0027434
27	9.0505194	9.9972423	9.0532771	10.9467229	33	.9494806	,0027577
28	9.0516354	9.9972280	9.0544074	10.9455926	32	.9483646	,0027720
29	9.0527485	9.9972137	9.0555349	10.9444651	31	.9472515	,002786
30	9.0538588	9.9971993	9.0566595	10.9433405	30	.9461412	,002800
	Sinus. Compl.	SINVS.	Tangens. Compl.	TANG.	M		

83 grad.

6 grad.

SINVS.	Sinus Compl.	TANG.	Tangens Compl.		Ar.Com. Sinus.	Ar. com. Sin.com.
9.0538588	9.9971993	9.0566595	10.9433405	30	.9461412	.0028007
9.0549661	9.9971849	9.0577813	10.9422187	29	.9450339	.0028151
9.0560706	9.9971704	9.0589002	10.9410998	28	.9439294	.0028296
9.0571723	9.9971559	9.0600164	10.9399836	27	.9428277	.0028441
9.0582711	9.9971414	9.0611297	10.9388703	26	.9417289	.0028586
9.0593672	9.9971268	9.0622403	10.9377597	25	.9406328	.0028732
9.0604604	9.9971122	9.0633482	10.9366518	24	.9395396	.0028878
9.0615509	9.9970976	9.0644533	10.9355467	23	.9384491	.0029024
9.0626386	9.9970829	9.0655556	10.9344444	22	.9373614	.0029171
9.0637235	9.9970682	9.0666553	10.9333447	21	.9362765	.0029318
9.0648057	9.9970535	9.0677522	10.9322478	20	.9351943	.0029465
9.0658852	9.9970387	9.0688465	10.9311535	19	.9341148	.0029613
9.0669619	9.9970239	9.0699381	10.9300619	18	.9330381	.0029761
9.0680360	9.9470090	9.0710270	10.9289730	17	.9319640	.0029910
9.0691074	9.9969941	9.0721133	10.9278867	16	.9308926	.0030059
9.0701761	9.9969792	9.0731969	10.9268031	15	.9298239	.0030208
9.0712421	9.9969642	9.0742779	10.9257221	14	.9287579	.0030358
9.0723055	9.9969492	9.0753563	10.9246437	13	.9276945	.0030508
9.0733663	9.9969342	9.0764321	10.9235679	12	.9266337	.0030658
9.0744244	9.9969191	9.0775053	10.9224947	11	.9255756	.0030809
9.0754799	9.9969040	9.0785760	10.9214240	10	.9245201	.0030960
9.0765328	9.9968888	9.0796441	10.9203559	9	.9234671	.0031112
9.0775832	9.9968736	9.0807096	10.9192904	8	.9224168	.0031264
9.0786310	9.9968584	9.0817726	10.9182274	7	.9213690	0 031416
9.0796762	9.9968431	9.0828331	10.9171669	6	.9203238	.0031569
9.0807189	9.9968278	9.0838911	10.9161089	5	.9192811	.0031722
9.0817590	9.9968125	9.0849466	10.9150534	4	.9182410	.0031875
9.0827966	9.9997971	9.0859996	10.9140004	3	.9172034	.0032029
9.0838317	9.9967817	9.0870501	10.9129499	2	.9161683	.0032183
9.0848643	9.9967662	9.0880981	10.9119019	1	.9151357	.0032338
9.0858945	9.9967507	9.0891438	10.9108562	0	.9141055	.0032493
Sinus Compl.	SINVS.	Tangens Compl.	TANG.	M		

83 grad.

7 grad.

M	SINVS.	Sinus. Compl.	TANG.	Tangens. Compl.		Ar.com. Sinus.	Ar.com. Sin.com.
0	9,0858945	9,9967507	9,0891438	10,9108562	60	,9141055	,0032493
1	9,0869221	9,9967352	9,0901869	10,9098131	59	,9130779	,0032648
2	9,0879473	9,9967196	9,0912277	10,9087723	58	,9120527	,0032804
3	9,0889700	9,9967040	9,0922660	10,9077340	57	,9110300	,0032960
4	9,0899903	9,9966884	9,0933020	10,9066980	56	,9100097	,0033116
5	9,0910082	9,9966727	9,0943355	10,9056645	55	,9089918	,0033273
6	9,0920237	9,9966570	9,0953667	10,9046333	54	,9079763	,0033430
7	9,0930367	9,9966412	9,0963955	10,9036045	53	,9069633	,0033588
8	9,0940474	9,9966254	9,0974219	10,9025781	52	,9059526	,0033746
9	9,0950556	9,9966096	9,0984460	10,9015540	51	,9049444	,0033904
10	9,0960615	9,9965937	9,0994678	10,9005322	50	,9039385	,0034063
11	9,0970651	9,9965778	9,1004872	10,8995128	49	,9029349	,0034222
12	9,0980662	9,9965619	9,1015044	10,8984956	48	,9019338	,0034381
13	9,0990651	9,9965459	9,1025192	10,8974808	47	,9009349	,0034541
14	9,1000616	9,9965299	9,1035317	10,8964683	46	,8999384	,0034701
15	9,1010558	9,9965138	9,1045420	10,8954580	45	,8989442	,0034862
16	9,1020477	9,9964977	9,1055500	10,8944500	44	,8979523	,0035022
17	9,1030373	9,9964816	9,1065557	10,8934443	43	,8969627	,0035184
18	9,1040246	9,9964655	9,1075591	10,8924409	42	,8959754	,0035345
19	9,1050096	9,9964493	9,1085604	10,8914396	41	,8949904	,0035507
20	9,1059924	9,9964330	9,1095594	10,8904406	40	,8940076	,0035670
21	9,1069729	9,9964167	9,1105562	10,8894438	39	,8930271	,0035833
22	9,1079512	9,9964004	9,1115508	10,8884492	38	,8920488	,0035996
23	9,1089272	9,9963841	9,1125431	10,8874569	37	,8910728	,0036159
24	9,1099010	9,9963677	9,1135333	10,8864667	36	,8900990	,0036323
25	9,1108726	9,9963513	9,1145213	10,8854787	35	,8891274	,0036487
26	9,1118420	9,9963348	9,1155072	10,8844928	34	,8881580	,0036652
27	9,1128092	9,9963183	9,1164909	10,8835091	33	,8871908	,0036817
28	9,1137742	9,9963018	9,1174724	10,8825276	32	,8862258	,0036982
29	9,1147370	9,9962852	9,1184518	10,8815482	31	,8852630	,0037148
30	9,11569[illegible]7	9,9962686	9,1194291	10,8805709	30	,8843023	,0037314
	Sinus. Compl.	SINVS.	Tangens. Compl.	TANG.	M		

82 grad.

7 grad.

SINVS.	Sinus Compl.	TANG.	Tangens Compl.		Ar.com. Sinus	Ar.com. Sin.com.
9.1156977	9.9962686	9.1194291	10.8805709	30	.8843023	.0037314
9.1166562	9.9962519	9.1204043	10.8795957	29	.8833438	.0037481
9.1176125	9.9962352	9.1213773	10.8786227	28	.8823875	.0037648
9.1185667	9.9962185	9.1223482	10.8776518	27	.8814332	.0037815
9.1195188	9.9962017	9.1233171	10.8766829	26	.8804812	.0037983
9.1204688	9.9961849	9.1242839	10.8757161	25	.8795312	.0038151
9.1214167	9.9961681	9.1252486	10.8747514	24	.8785833	.0038319
9.1223624	9.9961512	9.1262112	10.8737888	23	.8776376	.0038488
9.1233061	9.9961343	9.1271718	10.8728282	22	.8766939	.0038657
9.1242417	9.9961177	9.1281303	10.8718697	21	.8757523	.0038826
9.1251872	9.9961004	9.1290868	10.8709132	20	.8748128	.0038996
9.1261246	9.9960834	9.1300413	10.8699587	19	.8738754	.0039166
9.1270600	9.9960663	9.1309937	10.8690063	18	.8729400	.0039337
9.1279934	9.9960492	9.1319442	10.8680558	17	.8720066	.0039508
9.1289247	9.9960321	9.1328926	10.8671074	16	.8710753	.0039679
9.1298539	9.9960149	9.1338391	10.8661609	15	.8701461	.0039851
9.1307812	9.9959977	9.1347835	10.8652165	14	.8692188	.0040023
9.1317064	9.9959804	9.1357260	10.8642740	13	.8682936	.0040196
9.1326297	9.9959631	9.1366665	10.8633335	12	.8673703	.0040369
9.1335509	9.9959458	9.1376051	10.8623949	11	.8664491	.0040542
9.1344702	9.9959284	9.1385417	10.8614583	10	.8655298	.0040716
9.1353875	9.9959111	9.1394764	10.8605236	9	.8646125	.0040889
9.1363028	9.9958936	9.1404092	10.8595908	8	.8636972	.0041064
9.1372161	9.9958761	9.1413400	10.8586600	7	.8627839	.0041239
9.1381275	9.9958586	9.1422689	10.8577311	6	.8618725	.0041414
9.1390370	9.9958411	9.1431959	10.8568041	5	.8609630	.0041589
9.1399445	9.9958235	9.1441210	10.8558790	4	.8600555	.0041765
9.1408501	9.9958059	9.1450442	10.8549558	3	.8591499	.0041941
9.1417537	9.9957882	9.1459655	10.8540346	2	.8582463	.0042118
9.1426555	9.9957705	9.1468850	10.8531150	1	.8573445	.0042295
9.1435553	9.9957528	9.1478025	10.8531975	0	.8564447	.0042472
Sinus Compl.	SINVS.	Tangens Compl.	TANG.	M		

82 grad.

M	SINVS.	Sinus Compl.	TANG.	Tangens, Compl.		Ar.com. Sinus.	Ar.com. Sin com.
0	9.1435553	9.9957528	9.1478025	10.8521975	60	.8564447	.0042472
1	9.1444532	9.9957350	9.1487182	10.8512818	59	.8555468	.004265
2	9.1453493	9.9957172	9.1496321	10.8503679	58	.8546507	.004282
3	9.1462435	9.9956993	9.1505441	10.8494559	57	.8537565	.004300
4	9.1471358	9.9956815	9.1514543	10.8485457	56	.8528642	.004318
5	9.1480262	9.9956635	9.1523627	10.8476373	55	.8519738	.004336
6	9.1489148	9.9956456	9.1532692	10.8467308	54	.8510852	.004354
7	9.1498015	9.9956276	9.1541739	10.8458261	53	.8501985	.004372
8	9.1506864	9.9956095	9.1550769	10.8449231	52	.8493136	.004390
9	9.1515694	9.9955915	9.1559780	10.8440220	51	.8484306	.004408
10	9.1524507	9.9955734	9.1568773	10.8431227	50	.8475493	.004426
11	9.1533301	9.9955552	9.1577748	10.8422252	49	.8466699	.004444
12	9.1542076	9.9[illegible]5370	9.1586706	10.8413294	48	.8457924	.004463
13	9.1550834	9.9955188	9.1595646	10.8404354	47	.8449166	.004481
14	9.1559574	9.9955005	9.1604569	10.8395431	46	.8440426	.004499
15	9.1568296	9.9954822	9.1613473	10.8386527	45	.8431704	.00451
16	9.1577000	9.9954639	9.1622361	10.8377639	44	.8423000	.00453
17	9.1585686	9.9954455	9.1631231	10.8368769	43	.8414314	.004554
18	9.1594354	9.9954271	9.1640083	10.8359917	42	.8405646	.004572
19	9.1603005	9.9954087	9.1648919	10.8351081	41	.8396995	.00459
20	9.1611639	9.9953902	9.1657737	10.8342263	40	.8388361	.00460
21	9.1620254	9.9953717	9.1666538	10.8333462	39	.8379746	.00462
22	9.1628853	9.9953531	9.1675322	10.8324678	38	.8371147	.00464
23	9.1637434	9.9953345	9.1684089	10.8315911	37	.8362566	.00466
24	9.1645998	9.9953159	9.1692839	10.8307161	36	.8354002	.00468
25	9.1654544	9.9952972	9.1701572	10.8298428	35	.8345456	.00470
26	9.1663074	9.9952785	9.1710289	10.8289711	34	.8336926	.00472
27	9.1671586	9.9952597	9.1718989	10.8281011	33	.8328414	.00474
28	9.1680081	9.9952409	9.1727672	10.8272328	32	.8319919	.00475
29	9.1688559	9.9952221	9·1736338	10.8263662	31	.8311441	.0047
30	9.1697021	9.9952033	9.1744988	10.8255012	30	.8302979	.0047
	Sinus Compl.	SINVS.	Tangens Compl.	TANG.	M		

8 grad.

SINVS.	Sinus Compl.	TANG.	Tangens Compl.		Ar.com. Sinus.	Ar.Com Sin.com.
9.1697021	9.9952033	9.1744988	10.8255012	30	.8302979	.0047967
9.1705465	9.9951844	9.1753622	10.8246378	29	.8294535	.0048156
9.1713893	9.9951654	9.1762239	10.8237761	28	.8286107	.0048346
9.1722305	9.9951464	9.1770840	10.8229160	27	.8277695	.0048536
9.1730699	9.9951274	9.1779425	10.8220575	26	.8269301	.0048726
9.1739077	9.9951084	9.1787993	10.8212007	25	.8260923	.0048916
9.1747439	9.9950893	9.1796546	10.8203454	24	.8252561	.0049107
9.1755784	9.9950702	9.1805082	10.8194918	23	.8244216	.0049298
9.1767112	9.9950510	9.1813602	10.8186398	22	.8235888	.0049490
9.1772425	9.9950318	9.1822107	10.8177894	21	.8227575	.0049682
9.1780721	9.9950126	9.1830595	10.8169405	20	.8219279	.0049874
9.1789001	9.9949933	9.1839068	10.8160932	19	.8210999	.0050067
9.1797265	9.9949740	9.1847525	10.8152475	18	.8202735	.0050260
9.1805512	9.9949546	9.1855966	10.8144034	17	.8194488	.0050454
9.1813744	9.9949352	9.1864392	10.8135608	16	.8186256	.0050648
9.1821960	9.9949158	9.1872802	10.8127198	15	.8178040	.0050842
9.1830160	9.9948964	9.1881196	10.8118804	14	.8169840	.0051036
9.1838344	9.9948769	9.1889575	10.8110425	13	.8161656	.0051231
9.1846512	9.9948573	9.1897939	10.8102061	12	.8153488	.0051427
9.1854665	9.9948377	9.1906287	10.8093713	11	.8145335	.0051623
9.1862802	9.9948181	9.1914621	10.8085379	10	.8137198	.0051819
9.1870923	9.9947985	9.1922939	10.8077061	9	.8129077	.0052015
9.1879029	9.9947788	9.1931241	10.8068759	8	.8120971	.0052212
9.1887120	9.9947591	9.1939529	10.8060471	7	.8112880	.0052409
9.1895195	9.9947393	9.1947802	10.8052198	6	.8104805	.0052607
9.1903254	9.9947195	9.1956059	10.8043941	5	.8096746	.0052805
9.1911399	9.9946997	9.1964402	10.8035598	4	.8088701	.0053003
9.1919328	9.9946798	9.1972530	10.8027470	3	.8080672	.0053202
9.1927342	9.9946599	9.1980743	10.8019557	2	.8072658	.0053401
9.1935341	9.9946399	9.1988941	10.8011059	1	.8064659	.0053601
9.1943324	9.9946199	9.1997125	10.8002875	0	.8056676	.0053801
SINVS.	Sinus. Compl.	Tangens Compl.	TANG.	M.		

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M	SINVS.	Sinus Compl.	TANG.	Tangens Compl.		Ar.Com. Sinus.	Ar. com Sin.com
0	9.1943324	9.9946199	9.1997125	10.8002875	60	.8056676	.00538
1	9.1951293	9.9945999	9.2005294	10.7994706	59	.8048707	.00540
2	9.1959247	9.9945798	9.2013449	10.7986551	58	.8040753	.00542
3	9.1967186	9.9945597	9.2021588	10.7978412	57	.8032814	.00544
4	9.1975110	9.9945396	9.2029714	10.7970286	56	.8024860	.00546
5	9.1983019	9.9945194	9.2037825	10.7962175	55	.8016381	.00548
6	9.1990913	9.9944992	9.2045922	10.7954078	54	.8009087	.00550
7	9.1998793	9.9944789	9.2054004	10.7945996	53	.8001207	.00552
8	9.2006658	9.9944587	9.2062072	10.7937928	52	.7993342	.00554
9	9.2014509	9.9944383	9.2070126	10.7929874	51	.7985491	.00556
10	9.2022345	9.9944180	9.2078165	10.7921835	50	.7977655	.00558
11	9.2030167	9.9943975	9.2086191	10.7913809	49	.7969833	.00560
12	9.2037974	9.9943771	9.2094203	10.7905797	48	.7962026	.00562
13	9.2045766	9.9943566	9.2102200	10.7897800	47	.7954234	.00564
14	9.2053545	9.9943361	9.2110184	10.7889816	46	.7946455	.00564
15	9.2061309	9.9943156	9.2118153	10.7881847	45	.7938691	.00568
16	9.2069059	9.9942950	9.2126109	10.7873891	44	.7930941	.00570
17	9.2076795	9.9942743	9.2134051	10.7865949	43	.7923205	.00572
18	9.2084516	9.9942537	9.2141980	10.7858020	42	.7915484	.00574
19	9.2092224	9.9942330	9.2149894	10.7850106	41	.7907776	.00576
20	9.2099917	9.9942122	9.2157795	10.7842205	40	.7900083	.00578
21	9.2107567	9.9941914	9.2165683	10.7834317	39	.7892403	.00580
22	9.2115263	9.9941706	9.2173556	10.7826444	38	.7884737	.00582
23	9.2122914	9.9941498	9.2181417	10.7818583	37	.7877086	.0058
24	9.2130552	9.9941289	9.2189264	10.7810736	36	.7869448	.00587
25	9.2138176	9.9941079	9.2197097	10.7802903	35	.7861824	.0058
6	9.2145787	9.9940870	9.2204917	10.7795083	34	.7854213	.00591
27	9.2153384	9.9940659	9.2212724	10.7787276	33	.7846616	.00593
28	9.2160967	9.9940449	9.2220518	10.7779482	32	.7839033	.00595
29	9.2168536	9.9940238	9.2228298	10.7771702	31	.7831464	.00597
30	9.2176092	9.9940027	9.2236065	10.7763935	30	.7823908	.00599
	Sinus Compl.	SINVS.	Tangens Compl.	TANG.	M		

SINVS.	Sinus Compl.	TANG.	Tangens Compl.		Ar,com. Sinus.	Ar.Com Sin.com.
9,2176092	9,9940027	9,2236065	10,7763935	30	,7823908	,0059973
9,2183635	9,9939815	9,2243819	10,7756181	29	,7816365	,0060185
9,2191164	9,9939603	9,2251561	10,7748439	28	,7808836	,0060397
9,2198680	9,9939391	9,2259289	10,7740711	27	,7801320	,0060609
9,2206182	9,9939178	9,2267004	10,7732996	26	,7793818	,0060822
9,2213671	9,9938965	9,2274706	10,7725294	25	,7786329	,0061035
9,2221147	9,9938752	9,2282395	10,7717605	24	,7778853	,0061248
9,2228609	9,9938538	9,2290071	10,7709929	23	,7771391	,0061462
9,2236059	9,9938324	9,2297735	10,7702265	22	,7763941	,0061676
9,2243495	9,9938109	9,2305386	10,7694614	21	,7756505	,0061891
9,2250918	9,9937894	9,2313024	10,7686976	20	,7749082	,0062106
9,2258328	9,9937679	9,2320650	10,7679350	19	,7741672	,0062321
9,2265725	9,9937463	9,2328262	10,7671738	18	,7734275	,0062537
9,2273110	9,9937247	9,2335863	10,7664137	17	,7726890	,0062753
9,2280481	9,9937030	9,2343451	10,7656549	16	,7719519	,0062970
9,2287839	9,9936813	9,2351026	10,7648974	15	,7712161	,0063187
9,2295185	9,9936596	9,2358589	10,7641411	14	,7704815	,0063404
9,2302518	9,9936378	9,2366139	10,7633861	13	,7697432	,0063622
9,2309838	9,9936160	9,2373678	10,7626322	12	,7690162	,0063840
9,2317145	9,9935942	9,2381203	10,7618797	11	,7682855	,0064058
9,2324440	9,9935723	9,2388717	10,7611283	10	,7675560	,0064277
9,2331722	9,9935504	9,2396218	10,7603782	9	,7668278	,0064496
9,2338992	9,9935285	9,2403708	10,7596292	8	,7661008	,0064715
9,2346249	9,9935065	9,2411185	10,7588815	7	,7653751	,0064935
9,2353494	9,9934844	9,2418650	10,7581350	6	,7646506	,0065156
9,2360726	9,9934624	9,2426103	10,7573897	5	,7639274	,0065376
9,2367946	9,9934403	9,2433543	10,7566457	4	,7632054	,0065597
9,2375153	9,9934181	9,2440972	10,7559028	3	,7624847	,0065819
9,2382349	9,9933959	9,2448389	10,7551611	2	,7617651	,0066041
9,2389532	9,9933737	9,2455794	10,7544206	1	,7610468	,0066263
9,2396702	9,9933515	9,2463188	10.7536812	0	,7603298	,0066485
Sinus. Compl.	SINVS.	Tangens Compl.	TANG.	M		

M	SINVS.	Sinus Compl.	TANG.	Tangens Compl.		Ar.Com Sinus.	Ar.com Sin.com
0	9.2396702	9.9933515	9.2463188	10.7536812	60	.7603298	.00664
1	9.2403861	9.9933292	9.2470569	10.7529431	59	.7596139	.00667
2	9.2411007	9.9933068	9.2477939	10.7522061	58	.7588993	.00669
3	9.2418141	9.9932845	9.2485297	10.7514703	57	.7581859	.00671
4	9.2425264	9.9932621	9.2492643	10.7507357	56	.7574736	.00673
5	9.2432374	9.9932396	9.2499978	10.7500022	55	.7567626	.00676
6	9.2439472	9.9932171	9.2507301	10.7492699	54	.7560528	.00678
7	9.2446558	9.9931946	9.2514612	10.7485388	53	.7553442	.00680
8	9.2453632	9.9931720	9.2521912	10.7478088	52	.7546368	.00682
9	9.2460695	9.9931494	9.2529200	10.7470800	51	.7539305	.00685
10	9.2467746	9.9931268	9.2536477	10.7463523	50	.7532254	.00687
11	9.2474784	9.9931041	9.2543743	10.7456257	49	.7525216	.00689
12	9.2481811	9.9930814	9.2550997	10.7449003	48	.7518189	.00691
13	9.2488827	9.9930587	9.2558240	10.7441760	47	.7511173	.00694
14	9.2495830	9.9930359	9.2565472	10.7434528	46	.7504170	.00696
15	9.2502822	9.9930131	9.2572692	10.7427308	45	.7497178	.00698
16	9.2509803	9.9929902	9.2579901	10.7420099	44	.7490197	.00700
17	9.2516772	9.9929673	9.2587099	10.7412901	43	.7483228	.00703
18	9.2523729	9.9929444	9.2594285	10.7405715	42	.7476271	.00705
19	9.2530675	9.9929214	9.2601461	10.7398539	41	.7469325	.00707
20	9.2537609	9.9928984	9.2608625	10.7391375	40	.7462391	.007101
21	9.2544532	9.9928753	9.2615779	10.7384221	39	.7455468	.00712
22	9.2551444	9.9928522	9.2622921	10.7377079	38	.7448556	.00714
23	9.2558344	9.9928291	9.2630053	10.7369947	37	.7441656	.00717
24	9.2565233	9.9928059	9.2637173	10.7362827	36	.7434767	.00719
25	9.2572110	9.9927827	9.2644283	10.7355717	35	.7427890	.00721
26	9.2578977	9.9927595	9.2652382	10.7348618	34	.7421023	.00724
27	9.2585832	9.9927362	9.2658470	10.7341530	33	.7414168	.00726
28	9.2592676	9.9927129	9.2665547	10.7334453	32	.7407324	.00728
29	9.2599509	9.9926895	9.2672613	10.7327387	31	.7400491	.00731
30	9.2606330	9.9926661	9.2679669	10.7320331	30	.7393670	.00733
	Sinus Compl.	SINVS.	Tangens Compl.	TANG.	M		

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SINVS.	Sinus. Compl.	TANG.	Tangens Compl.		Ar.com. Sinus.	Ar.com. Sin.com.
9.2606330	9.9926661	9.2679669	10.7320331	30	.7393670	.0073339
9.2613141	9.9926427	9.2686714	10.7313286	29	.7386859	.0073573
9.2619941	9.9926192	9.2693749	10.7306251	28	.7380059	.0073808
9.2626729	9.9925957	9.2700772	10.7299228	27	.7373271	.0074043
9.2633507	9.9925722	9.2707786	10.7292214	26	.7366493	.0074278
9.2640274	9.9925486	9.2714788	10.7285212	25	.7359726	.0074514
9.2647030	9.9925250	9.2721780	10.7278220	24	.7352970	.0074750
9.2653775	9.9925013	9.2728762	10.7271238	23	.7346225	.0074987
9.2660509	9.9924776	9.2735733	10.7264267	22	.7339491	.0075224
9.2667232	9.9924539	9.2742694	10.7257306	21	.7332768	.0075461
9.2673945	9.9924301	9.2749644	10.7250356	20	.7326055	.0075699
9.2680647	9.9924063	9.2756584	10.7243416	19	.7319353	.0075937
9.2687338	9.9923824	9.2763514	10.7236486	18	.7312662	.0076176
9.2694019	9.9923585	9.2770434	10.7229566	17	.7305981	.0076415
9.2700689	9.9923346	.2777343	10.7222657	16	.7299311	.0076654
9.2707348	9.9923106	,2784242	10.7215758	15	.7292652	.0076894
9.2713997	9.9922866	9.2791131	10.7208869	14	.7286003	.0077134
9.2720635	9.9922626	9.2798009	10.7201991	13	.7279365	.0077374
9.2727263	9.9922385	9.2804878	10.7195122	12	.7272737	.0077615
9.2733880	9.9922144	9.2811736	10.7188264	11	.7266120	.0077856
9.2740487	9.9921902	9.2818585	10.7181415	10	259513	.0078098
9.2747083	9.9921660	9.2825423	10.7174577	9	.7252917	0078340
9.2753669	9.9921418	9.2832251	10.7167749	8	.7246331	.0078582
9.2760245	9.9921175	9.2839070	10.7160930	7	.7239755	.0078825
9.2766811	9.9920932	9.2845878	10.7154122	6	.7233189	.0079068
9.2773366	9.9920689	9.2852677	10.7147323	5	.7226634	.0079311
9.2779911	9.9920445	9.2859466	10.7140534	4	.7220089	.0079555
9.2786445	9.9920201	9.2866245	10.7133755	3	.7213555	.0079799
9.2792970	9.9919956	9.2873014	10.7126986	2	.7207030	.0070044
9.2799484	9.9919711	9.2879773	10.7120227	1	.7200516	.0070289
9.2805988	9.9919466	9.2886523	10.7113477	0	.7194012	.0070534
Sinus Compl.	SINVS.	Tangens Compl.	TANG.	M		

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M	SINVS.	Sinus. Compl.	TANG.	Tangens Compl.		Ar.com. Sinus.	Ar.com. Sin.com
0	9,2805988	9,9919466	9,2886523	10,7113477	60	,7194012	,0080534
1	9,2812483	9,9919220	9,2893263	10,7106737	59	,7187517	,0080780
2	9,2818967	9,9918974	9,2899993	10,7100007	58	,7181033	,0081026
3	9,2825441	9,9918727	9,2906713	10,7093287	57	,7174559	,0081273
4	9,2831905	9,9918480	9,2913424	10,7086576	56	,7168095	,0081520
5	9,2838359	9,9918233	9,2920126	10,7079874	55	,7161641	,0081767
6	9,2844803	9,9917986	9,2926817	10,7073183	54	,7155197	,0082014
7	9,2851237	9,9917737	9,2933500	10,7066500	53	,7148763	,0082263
8	9,2857661	9,9917489	9,2940172	10,7059828	52	,7142339	0082511
9	9,2864076	9,9917240	9,2946836	10,7053164	51	,7135924	,0082760
10	9,2870480	9,9916991	9,2953489	10,7046511	50	,7129520	,0083009
11	9,2876875	9,9916741	9,2960134	10,7039866	49	,7123125	,0083259
12	9,2883260	9,9916492	9,2966769	10,7033231	48	,7116740	,0083508
13	9,2889636	9,9916241	9,2973395	10,7026605	47	,7110364	,0083759
14	9,2896001	9,9915990	9,2980011	10,7019989	46	,7103999	,0084010
15	9,2902357	9,9915739	9,2986618	10,7013382	45	,7097643	,0084261
16	9,2908704	9,9915488	9,2993216	10,7006784	44	,7091296	,0084512
17	9,2915040	9,9915236	9,2999804	10,7000196	43	,7084960	,0084764
18	9,2921367	9,9914984	9,3006383	10,6993617	42	,7078633	,0085016
19	9,2927685	9,9914731	9,3012954	10,6987046	41	,7072315	,0085269
20	9,2933993	9,9914478	9,3019514	10,6980486	40	,7066007	,0085522
21	9,2940291	9,9914225	9,3026066	10,6973934	39	,7059709	,0085775
22	9,2946580	9,9913971	9,3032609	10,6967391	38	,7053420	,0086029
23	9,2952859	9,9913717	9,3039143	10,6960857	37	,7047141	,0086283
24	9,2959129	9,9913462	9,3045667	10,6954333	36	,7040871	,0086538
25	9,2965390	9,9913207	9,3052183	10,6947817	35	,7034610	,0086793
26	9,2971641	9,9912952	9,3058689	10,6941311	34	,7028359	,0087048
27	9,2977883	9,9912696	9,3065187	10,6934813	33	,7022117	,0087304
28	9,2984116	9,9912440	9,3071675	10,6928425	32	,7015884	,0087560
29	9,2990339	9,9912184	9,3078155	10,6921845	31	,7009661	,0087816
30	9,2996553	9,9911927	9,3084626	10,6915374	30	,7003447	,0088073
	Sinus. Compl.	SINVS.	Tangens. Compl.	TANG.	M		

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SINVS.	Sinus Compl.	TANG.	Tangens. Compl.		Ar.com. Sinus.	Ar. com Sin.com.
9.2996553	9.9911927	9.3084626	10.6915374	30	.7003447	.0088073
9.3002758	9.9911670	9.3091088	10.6908912	29	.6997242	.0088330
9.3008953	9.9911412	9.3097541	10.6902459	28	.6991047	.0088588
9.3015140	9.9911154	9.3103985	10.6896015	27	.6984860	.0088846
9.3021317	9.9910896	9.3110421	10.6889579	26	.6978683	.0089104
9.3027485	9.9910637	9.3116848	10.6883152	25	.6972515	.0089363
9.3033644	9.9910378	9.3123266	10.6876734	24	.6966356	.0089622
9.3039794	9.9910119	9.3129675	10.6870325	23	.6960206	.0089881
9.3045934	9.9909859	9.3136076	10.6863924	22	.6954066	.0090141
9.3052066	9.9909598	9.3142468	10.6857532	21	.6947934	.0090402
9.3058189	9.9909338	9.3148851	10.6851149	20	.6941811	.0090662
9.3064303	9.9909077	9.3155226	10.6844774	19	.6935697	.0090923
9.3070407	9.9908815	9.3161592	10.6838408	18	.6929593	.0091185
9.3076503	9.9908553	9.3167950	10.6832050	17	.6923497	.0091447
9.3082590	9.9908291	9.3174299	10.6825701	16	.6917410	.0091709
9.3088668	9.9908029	9.3180640	10.6819360	15	.6911332	.0091971
9.3094737	9.9907766	9.3186971	10.6813028	14	.6905263	.0092234
9.3100798	9.9907502	9.3193295	10.6806705	13	.6899202	.0092498
9.3106849	9.9907239	9.3199611	10.6800389	12	.6893151	.0092761
9.3112892	9.9906974	9.3205918	10.6794082	11	.6887108	.0093026
9.3118926	9.9906710	9.3212216	10.6787784	10	.6881074	.0093290
9.3124951	9.9906445	9.3218506	10.6781494	9	.6875049	.0093555
9.3130968	9.9906180	9.3224788	10.6775212	8	.6869032	.0093820
9.3136976	9.9905914	9.3231061	10.6768939	7	.6863024	.0094086
9.3142975	9.9905648	9.3237327	10.6762673	6	.6857025	.0094352
9.3148965	9.9905382	9.3243584	10.6756416	5	.6851035	.0094618
9.3154949	9.9905115	9.3249832	10.6750168	4	.6845053	.0094885
9.3160921	9.9904848	9.3256073	10.6743927	3	.6839079	.0095152
9.3166885	9.9904580	9.3262305	10.6737695	2	.6833115	.0095420
9.3172841	9.9904312	9.3268529	10.6731471	1	.6827159	.0095688
9.3178789	9.9904044	9.3274745	10.6725255	0	.6821211	.0095956
Sinus Compl.	SINVS.	Tangens Compl.	TANG.	M		

M	SINVS.	Sinus Compl.	TANG.	Tangens. Compl.		Ar.com. Sinus	Ar.com. Sin.com.
0	9.3178789	9.9904044	9.3274745	10.6725255	60	.6821211	.0095956
1	9.3184728	9.9903775	9.3280953	10.6719047	59	.6815272	.0096225
2	9.3190659	9.9903506	9.3287153	10.6712847	58	.6809341	.0096494
3	9.3196581	9.9903237	9.3293345	10.6706655	57	.6803419	.0096763
4	9.3202495	9.9902967	9.3299528	10.6700472	56	.6797505	.0097033
5	9.3208400	9.9902697	9.3305704	10.6694296	55	.6791600	.0097303
6	9.3214297	9.9902426	9.3311872	10.6688128	54	.6785703	.0097574
7	9.3220186	9.9902155	9.3318031	10.6681969	53	.6779814	.0097845
8	9.3226066	9.9901883	9.3324183	10.6675817	52	.6773934	.0098117
9	9.3231938	9.9901612	9.3330327	10.6669673	51	.6768062	.0098388
10	9.3237802	9.9901339	9.3336463	10.6663537	50	.6762198	.0098661
11	9.3243657	9.9901067	9.3342591	10.6657409	49	.6756343	.0098933
12	9.3249505	9.9900794	9.3348711	10.6651289	48	.6750495	.0099206
13	9.3255344	9.9900521	9.3354823	10.6645177	47	.6744656	.0099479
14	9.3261174	9.9900247	9.3360927	10.6639073	46	.6738826	.0099753
15	9.3266997	9.9899973	9.3367024	10.6632976	45	.6733003	.0100027
16	9.3272811	9.9899698	9.3373113	10.6626887	44	.6727189	.0100302
17	9.3278617	9.9899423	9.3379194	10.6620806	43	.6721383	.0100577
18	9.3284416	9.9899148	9.3385267	10.6614733	42	.6715584	.0100852
19	9.3290206	9.9898873	9.3391333	10.6608667	41	.6709794	.0101127
20	9.3295988	9.9898597	9.3397391	10.6602609	49	.6704012	.0101403
21	9.3301761	9.9898320	9.3403441	10.6596559	39	.6698239	.0101680
22	9.3307527	9.9898043	9.3409484	10.6590516	38	.6692473	.0101957
23	9.3313285	9.9897766	9.3415519	10.6584481	37	.6686715	.0102234
24	9.3319035	9.9897489	9.3421546	10.6578454	36	.6680965	.0102511
25	9.3324777	9.9897211	9.3427566	10.6572434	35	.6675223	.0102789
26	9.3330511	9.9896932	9.3433578	10.6566422	34	.6669489	.0103008
27	9.3336237	9.9896654	9.3439583	10.6560417	33	.6663763	.0103346
28	9.3341955	9.9896374	9.3445580	10.6554420	32	.6658045	.0103626
26	9.3347665	9.9896095	9.3451570	10.6548430	31	.6652335	.0103905
30	9.3353368	9.9895815	9.3457552	10.6542448	30	.6646632	.0104185
	Sinus. Compl.	SSINVS	Tangens Compl.	TANG.	M		

SINVS.	Sinus Compl.	TANG.	Tangens Compl.		Ar.com. Sinus.	Ar.com. Sin.com.
9.3353368	9.9895815	9.3457552	10.6542448	30	.6646632	.0104185
9.3359062	9.9895535	9.3463527	10.6536473	29	.6640938	.0104465
9.3364749	9.9895254	9.3469494	10.6530506	28	.6635251	.0104746
9.3370428	9.9894973	9.3475454	10.6524546	27	.6629572	.0105027
9.3376099	9.9894692	9.3481407	10.6518593	26	.6623901	.0105308
9.3381762	9.9894410	9.3487352	10.6512648	25	.6618274	.0105590
9.3387418	9.9894128	9.3493290	10.6506710	24	.6612582	.0105872
9.3393065	9.9893845	9.3499220	10.6500780	23	.6606935	.0106155
9.3398706	9.9893562	9.3505143	10.6494857	22	.6601294	.0106438
9.3404338	9.9893279	9.3511059	10.6488941	21	.6595662	.0106721
9.3409963	9.9892995	9.3516968	10.6483032	20	.6590037	.0107005
9.3415580	9.9892711	9.3522869	10.6477131	19	.6584420	.0107289
9.3421190	9.9892427	9.3528763	10.6471237	18	.6578810	.0107573
9.3426792	9.9892142	9.3534650	10.6465350	17	.6573208	.0107858
9.3432386	9.9891856	9.3540530	10.6459470	16	.6567614	.0108144
9.3437973	9.9891571	9.3546402	10.6453598	15	.6562027	.0108429
9.3443552	9.9891285	9.3552267	10.6447733	14	.6556448	.0108716
9.3449124	9.9890998	9.3558126	10.6441874	13	.6550876	.0109002
9.3454688	9.9890711	9.3563977	10.6436023	12	.6545312	.0109289
9.3460245	9.9890424	9.3569821	10.6430179	11	.6539755	.0109576
9.3465794	9.9890137	9.3575658	10.6424342	10	.6534206	.0109863
9.3471336	9.9889849	9.3581487	10.6418513	9	.6528664	.0110151
9.3476870	9.9889560	9.3587310	10'6412690	8	.6523130	.0110440
9.3482397	9.9889271	9.3593126	10.6406874	7	.6517603	.0110729
9.3487917	9.9888982	9.3598935	10.6401065	6	.6512083	.0111018
9.3493429	9.9888693	9.3604736	10.6395264	5	.6506571	.0111307
9.3498934	9.9888403	9.3610531	10.6389469	4	.6501066	.0111597
9.3504432	9.9888113	9.3616319	10.6383681	3	.6495568	.0111887
9.3509922	9.9887822	9'3622100	10.6377900	2	.6490078	.0112178
9.3515405	9.9887531	9.3627874	10.6372126	1	.6484595	.0112469
9.3520880	9.9887239	9.3633641	10.6366359	0	.6479120	.0112761
Sinus. Compl.	SINVS.	Tangens Compl.	TANG.	M		

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M	SINVS.	Sinus. Compl.	TANG.	Tangens Compl.		Ar.com. Sinus.	Ar.com. Sin.com.
0	9.3520880	9,9887239	9.3633641	10,6366359	60	,6479120	,0112761
1	9.3526349	9,9886947	9.3639401	10,6360599	59	,6473651	,0113053
2	9.3531810	9,9886655	9.3645155	10,6354845	58	,6468190	,0113345
3	9.3537264	9,9886363	9.3650901	10,6349099	57	,6462736	,0113637
4	9.3542719	9,9886070	9.3656641	10,6343359	56	,6457290	,0113930
5	9.3548150	9,9885776	9.3662374	10,6337626	55	,6451850	,0114224
6	9.3553582	9,9885482	9.3668100	10,6331900	54	,6446418	,0114518
7	9.3559007	9,9885188	9.3673819	10,6326181	53	,6440993	,0114812
8	9.3564426	9,9884894	9.3679532	10,6320468	52	,6435574	,0115106
9	9.3569836	9,9884599	9.3685238	10,6314762	51	,6430164	,0115401
10	9.3575240	9,9884303	9.3690937	10,6309063	50	,6424760	,0115697
11	9.3580637	9,9884008	9.3696629	10,6303371	49	,6419363	,0115992
12	9.3586027	9,9883712	9.3702315	10,6297685	48	,6413973	,0116288
13	9.3591409	9,9883415	9.3707994	10,6292006	47	,6408591	,0116585
14	9.3596785	9,9883118	9.3713667	10,6286333	46	,6403215	,0116882
15	9.3602154	9,9882821	9.3719333	10,6280667	45	,6397846	,0117179
16	9.3607515	9,9882523	9.3724992	10,6275008	44	,6392485	,0117477
17	9.3612870	9,9882225	9.3730645	10,6269355	43	,6387130	,0117775
18	9.3618217	9,9881927	9.3736291	10,6263709	42	,6381783	,0118073
19	9.3623558	9,9881628	9.3741930	10,6258070	41	,6376442	,0118372
20	9.3628892	9,9881329	9.3747563	10,6252437	40	,6371108	,0118671
21	9.3634219	9,9881029	9.3753190	10,6246810	39	,6365781	,0118971
22	9.3639539	9,9880729	9.3758810	10,6241190	38	,6360461	,0119271
23	9.3644852	9,9880429	9.3764423	10,6235577	37	,6355148	,0119571
24	9.3650158	9,9880128	9.3770030	10,6229970	36	,6349842	,0119872
25	9.3655458	9,9879827	9.3775631	10,6224369	35	,6344542	,0120173
26	9.3660750	9,9879525	9.3781225	10,6218775	34	,6339250	,0120475
27	9.3666036	9,9879223	9.3786813	10,6213187	33	,6333964	,0120777
28	9.3671315	9,9878921	9.3792394	10,6207606	32	,6328685	,0121079
29	9.3676587	9,9878618	9.3797969	10,6202031	31	,6323413	,0121382
30	9.3681853	9,9878315	9.3803537	10,6196463	30	,6318147	,0121685
	Sinus Compl.	SINVS.	Tangens Compl.	TANG.	M		

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M	SINVS.	Sinus Compl.	TANG.	Tangens Compl.		Ar.com. Sinus.	Ar.com. Sin.com.
30	9.3681853	9.9878315	9.3803537	10.6196463	30	.6318147	.0121685
31	9.3687111	9.9878012	9.3809100	10.6190900	29	.6312889	.0121988
32	9.3692363	9.9877708	9.3814655	10.6185345	28	.6307637	.0122292
33	9.3697608	9.9877404	9.3820205	10.6179795	27	.6302392	.0122596
34	9.3702847	9.9877099	9.3825748	10.6174252	26	.6297153	.0122901
35	9.3708079	9.9876794	9.3831285	10.6168715	25	.6291921	.0123206
36	9.3713304	9.9876488	9.3836816	10.6163184	24	.6286696	.0123512
37	9.3718523	9.9876183	9.3842340	10.6157660	23	.6281477	.0123817
38	9.3723735	9.9875876	9.3847858	10.6152142	22	.6276265	.0124124
39	9.3728940	9.9875570	9.3853370	10.6146630	21	.6271060	.0124430
40	9.3734139	9.9875263	9.3858876	10.6141124	20	.6265861	.0124737
41	9.3739331	9.9874955	9.3864376	10.6135624	19	.6260669	.0125045
42	9.3744517	9.9874648	9.3869869	10.6130131	18	.6255483	.0125352
43	9.3749696	9.9874339	9.3875356	10.6124644	17	.6250304	.0125661
44	9.3754868	9.9874031	9.3880837	10.6119163	16	.6245132	.0125969
45	9.3760034	9.9873722	9.3886312	10.6113688	15	.6239966	.0126278
46	9.3765194	9.9873413	9.3891781	10.6108219	14	.6234806	.0126587
47	9.3770347	9.9873103	9.3897244	10.6102756	13	.6229653	.0126897
48	9.3775493	9.9872793	9.3902700	10.6097300	12	.6224507	.0127207
49	9.3780633	9.9872482	9.3908151	10.6091849	11	.6219367	.0127518
50	9.3785767	9.9872171	9.3913595	10.6086405	10	.6214233	.0127829
51	9.3790894	9.9871860	9.3919034	10.6080966	9	.6209106	.0128140
52	9.3796015	9.9871545	9.3924466	10'6075534	8	.6203985	.0128451
53	9.3801129	9.9871236	9.3929893	10.6070107	7	.6198871	.0128764
54	9.3806237	9.9870924	9.3935313	10.6064687	6	.6193763	.0129076
55	9.3811339	9.9870611	9.3940727	10.6059273	5	.6188661	.0129389
56	9.3816434	9.9870298	9.3946136	10.6053864	4	.6183566	.0129702
57	9.3821523	9.9869984	9.3951538	10.6048462	3	.6178477	.0130016
58	9.3826605	9.9869670	9'3956935	10.6043065	2	.6173395	.0130330
59	9.3831682	9.9869356	9.3962326	10.6037674	1	.6168318	.0130644
60	9.3836752	9.9869041	9.3967711	10.6032289	0	.6163248	.0130959
	Sinus. Compl.	SINVS.	Tangens Compl.	TANG.	M		

M	SINVS	Sinus. Compl.	TANG.	Tangens Compl.		Ar.com. Sinus.	Ar.com. Sin.com.
0	9.3836752	9.9869041	9.3967711	10,6032289	60	,6163248	,0130959
1	9.3841815	9.9868726	9.3973089	10,6026911	59	,6158185	,0131274
2	9.3846873	9.9868410	9.3978463	10,6021537	58	,6153127	,0131590
3	9.3851924	9.9868094	9.3983830	10,6016170	57	,6148076	,0131906
4	9.3856969	9.9867778	9.3989191	10,6010809	56	,6143031	,0132222
5	9.3862008	9.9867461	9.3994547	10,6005453	55	,6137992	,0132539
6	9.3867040	9.9867144	9.3999896	10,6000104	54	,6132960	,0132856
7	9.3872067	9.9866827	9.4005240	10,5994760	53	,6127933	,0133173
8	9.3877087	9.9866509	9.4010578	10,5989422	52	,6122913	,0133491
9	9.3882101	9.9866191	9.4015910	10,5984090	51	,6117899	,0133809
10	9.3887109	9.9865872	9.4021237	10,5978763	50	,6112891	,0134128
11	9.3892111	9.9865553	9.4026558	10,5973442	49	,6107889	,0134447
12	9.3897106	9.9865233	9.4031873	10,5968127	48	,6102894	,0134767
13	9.3902096	9.9864913	9.4037182	10,5962818	47	,6097904	,0135087
14	9.3907079	9.9864593	9.4042486	10,5957514	46	,6092921	,0135407
15	9.3912057	9.9864272	9.4047784	10,5952216	45	,6087943	,0135727
16	9.3917028	9.9863951	9.4053076	10,5946924	44	,6082972	,0136048
17	9.3921993	9.9863630	9.4058363	10,5941637	43	,6078007	,0136370
18	9.3926952	9.9863308	9.4063644	10,5936356	42	,6073048	,0136692
19	9.3931905	9.9862986	9.4068919	10,5931081	41	,6068095	,0137014
20	9.3936852	9.9862663	9.4074189	10,5925810	40	,6063148	,0137337
21	9.3941794	9.9862340	9.4079453	10,5920547	39	,6058206	,0137660
22	9.3946729	9.9862017	9.4084712	10,5915288	38	,6053271	,0137983
23	9.3951658	9.9861693	9.4089965	10,5910035	37	,6048342	,01383[illegible]
24	9.3956581	9.9861369	9.4095212	10,5904788	36	,6043419	,01386[illegible]
25	9.3961499	9.9861045	9.4100454	10,5899546	35	,6038501	,0138[illegible]
26	9.3966410	9.9860720	9.4105690	10,5894310	34	,6033590	,0139[illegible]
27	9.3971315	9.9860394	9.4110921	10,5889079	33	,6028685	,0139[illegible]
28	9.3976215	9.9860069	9.4116146	10,5883854	32	,6023785	,0139[illegible]
29	9.3981109	9.9859742	9.4121366	10,5878634	31	,6018891	,0140[illegible]
30	9.3985996	9.9859416	9.4126581	10,5873419	30	,6014004	,0140[illegible]
	Sinus. Compl.	SINVS.	Tangens. Compl.	TANG.	M		

14 grad.

SINVS.	Sinus. Compl.	TANG.	Tangens Compl.		Ar.com. Sinus.	Ar. com. Sin. com
9.3985996	9.9859416	9.4126581	10.5873419	30	.6014004	.0140584
9.3990878	9.9859089	9.4131789	10.5868211	29	.6009122	.0140911
9.3995754	9.9858762	9.4136993	10.5863007	28	.6004246	.0141238
9.4000625	9.9858434	9.4142191	10.5857809	27	.5999375	.0141566
9.4005489	9.9858106	9.4147383	10.5852617	26	.5994511	.0141894
9.4010348	9.9857777	9.4152570	10.5847430	25	.5989652	.0142223
9.4015201	9.9857449	9.4157752	10.5842248	24	.5984799	.0142551
9.4020048	9.9857119	9.4162928	10.5837072	23	.5979952	.0142881
9.4024889	9.9856790	9.4168099	10.5831901	22	.5975111	.0143210
9.4029734	9.9856460	9.4173265	10.5826735	21	.5970276	.0143540
9.4034554	9.9856129	9.4178425	10.5821575	20	.5965446	.0143871
9.4039378	9.9855798	9.4183580	10.5816420	19	.5960622	.0144202
9.4044196	9.9855467	9.4188729	10.5811271	18	.5955804	.0144533
9.4049009	9.9855135	9.4193874	10.5806126	17	.5950991	.0144865
9.4053816	9.9854803	9.4199013	10.5800987	16	.5946184	.0145197
9.4058617	9.9854471	9.4204146	10.5795854	15	.5941383	.0145529
9.4063413	9.9854138	9.4209274	10.5790725	14	.5936587	.0145862
9.4068203	9.9853805	9.4214398	10.5785602	13	.5931797	.0146195
9.4072987	9.9853471	9.4219515	10.5780485	12	.5927013	.0146529
9.4077766	9.9853138	9.4224628	10.5775372	11	.5922234	.0146862
9.4082539	9.9852803	9.4229735	10.5770265	10	.5917461	.0147197
9.4087306	9.9852468	9.4234833	10.5765162	9	.5912694	.0147532
9.4092068	9.9852133	9.4239935	10.5760065	8	.5907932	.0147867
9.4096824	9.9851798	9.4245026	10.5754974	7	.5903176	.0148202
9.4101575	9.9851462	9.4250113	10.5749887	6	.5898425	.0148538
9.4106320	9.9851125	9.4255194	10.5744806	5	.5893680	.0148875
9.4111059	9.9850789	9.4260271	10.5739729	4	.5888941	.0149211
9.4115793	9.9850452	9.4265342	10.5734658	3	.5884207	.0149548
9.4120522	9.9850114	9.4270408	10.5729592	2	.5879478	.0149886
9.4125245	9.9849776	9.4275469	10.5724531	1	.5874755	.0150224
9.4129962	9.9849438	9.4280525	10.5719475	0	.5870038	.0150562
Sinus. Compl.	SINVS.	Tangens Comple	TANG	M		

75 grad.

M	SINVS.	Sinus. Compl.	TANG.	Tangens Compl.		Ar. com. Sinus.	Ar. com. Sin. com
0	9.4129962	9.9849438	9.4280525	10.5719475	60	.5870038	.0150562
1	9.4134674	9.9849099	9.4285575	10.5714425	59	.5865326	.0150901
2	9.4139381	9.9848760	9.4290621	10.5709379	58	.5860619	.0151240
3	9.4144082	9.9848420	9.4295661	10.5704339	57	.5855918	.0151580
4	9.4148778	9.9848081	9.4300697	10.5699303	56	.5851222	.0151919
5	9.4153468	9.9847740	9.4305727	10.5694273	55	.5846532	.0152260
6	9.4158152	9.9847400	9.4310753	10.5689247	54	.5841848	.0152600
7	9.4162832	9.9847059	9.4315773	10.5684227	53	.5837168	.0152941
8	9.4167506	9.9846717	9.4320789	10.5679211	52	.5832494	.0153283
9	9.4172174	9.9846375	9.4325799	10.5674201	51	.5827826	.0153625
10	9.4176837	9.9846033	9.4330804	10.5669196	50	.5823163	.0153970
11	9.4181495	9.9845690	9.4335805	10.5664195	49	.5818505	.0154310
12	9.4186148	9.9845347	9.4340800	10.5659200	48	.5813852	.0154653
13	9.4190795	9.9845004	9.4345791	10.5654209	47	.5809205	.0154996
14	9.4195436	9.9844660	9.4350776	10.5649224	46	.5804564	.0155340
15	9.4200073	9.9844316	9.4355757	10.5644242	45	.3799927	.0155684
16	9.4204704	9.9843971	9.4360733	10.5639267	44	.5795296	.0156029
17	9.4209330	9.9843626	9.4365704	10.5634296	43	.5790670	.0156374
18	9.4213950	9.9843281	9.4370670	10.5629330	42	.5786050	.0156719
19	9.4218566	9.9842935	9.4375630	10.5624369	41	.5781434	.015706
20	9.4223176	9.9842589	9.4380587	10.5619413	40	.5776824	.0157411
21	9.4227780	9.9842242	9.4385538	10.5614462	39	.5772220	.0157758
22	9.4232380	9.9841895	9.4390485	10.5609515	38	.5767620	.0158105
23	9.4236974	9.9841548	9.4395426	10.5604574	37	.5763026	.0158452
24	9.4241563	9.9841200	9.4400363	10.5599637	36	.5758437	.0158800
25	9.4246147	9.9840852	9.4405295	10.5594705	35	.5753853	.0159148
26	9.4250726	9.9840503	9.4410222	10.5589778	34	.5749274	.015949
27	9.4255299	9.9840154	9.4415145	10.5584855	33	.5744701	.015984
28	9.4259867	9.9839805	9.4420062	10.5579938	32	.5740133	.016019
26	9.4264430	9.9839455	9.4424975	10.5575025	31	.5735570	.016054
30	9.4268988	9.9839105	9.4429883	10.5570117	30	.5731012	.016089
—	Sinus. Compl.	SINVS.	Tangens Comple.	TANG.	M		

15 grad.

SINVS.	Sinus. Compl.	TANG.	Tangens Compl.		Ar.com. Sinus.	Ar.com. Sin.com
9.4268988	9.9839105	9.4429883	10.5570117	30	.5731012	.0160895
9.4273541	9.9838755	9.4434786	10.5565214	29	.5726459	.0161245
9.4278089	9.9838404	9.4439685	10.5560315	28	.5721911	.0161596
9.4282631	9.9838052	9.4444579	10.5555421	27	.5717369	.0161948
9.4287169	9.9837701	9.4449468	10.5550532	26	.5712831	.0162299
9.4291701	9.9837348	9.4454352	10.5545648	25	.5708299	.0162652
9.4296228	9.9836996	9.4459232	10.5540768	24	.5703772	.0163004
9.4300750	9.9836643	9.4464107	10.5535893	23	.5699250	.0163357
9.4305267	9.9836290	9.4468978	10.5531022	22	.5694733	.0163710
9.4309779	9.9835936	9.4473843	10.5526157	21	.5690221	.0164064
9.4314286	9.9835582	9.4478704	10.5521296	20	.5685714	.0164418
9.4318788	9.9835227	9.4483561	10.5516439	19	.5681212	.0164773
9.4323285	9.9834872	9.4488413	10.5511587	18	.5676715	.0167128
9.4327777	9.9834517	9.4493260	10.5506740	17	.5672223	.0165483
9.4332264	9.9834161	9.4498102	10.5501898	16	.5667736	.0165839
9.4336746	9.9833805	9.4502940	10.5497060	15	.5663254	.0166195
9.4341223	9.9833449	9.4507774	10.5492226	14	.5658777	.0166551
9.4345694	9.9833092	9.4512602	10.5487398	13	.5654306	.0166908
9.4350161	9.9832735	9.4517427	10.5482573	12	.5649839	.0167265
9.4354623	9.9832377	9.4522246	10.5477754	11	.5645377	.0167623
9.4359080	9.9832019	9.4527061	10.5472939	10	.5640920	0.167981
9.4363532	9.9831661	9.4531872	10.5468128	9	.5636468	.0168339
9.4367980	9.9831302	9.4536678	10.5463322	8	.5632020	.0168698
9.4372422	9.9830942	9.4541479	10.5458521	7	.5627578	.0169058
9.4376859	9.9830583	9.4546276	10.5453724	6	.5623141	.0169417
9.4381292	9.9830223	9.4551069	10.5448931	5	.5618708	.0169777
9.4385719	9.9829862	9.4555857	10.5444143	4	.5614281	.0170138
9.4390142	9.9829501	9.4560641	10.5439359	[illegible]	.5609858	.0170499
9.4394560	9.9829140	9.4565420	10.5434580	2	.5605440	.0170860
9.4398973	9.9828778	9.4570194	10.5429806	1	.5601027	.0171222
9.4403381	9.9828416	9.4574964	10.5425036	0	.5596619	.0171586
Sinus. Compl.	SINVS.	Tangens. Compl.	TANG.	M		

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M	SINVS.	Sinus. Compl.	TANG.	Tangens Compl.		Ar.com. Sinus.	Ar.com. Sin.com
0	9.4403381	9.9828416	9.4574964	10.5425036	60	.5596619	.0171584
1	9.4407784	9.9828054	9.4579730	10.5420270	59	.5592216	.0171946
2	9.4412182	9.9827691	9.4584491	10.5415509	58	.5587818	.0172309
3	9.4416576	9.9827328	9.4589248	10.5410752	57	.5583424	.0172672
4	9.4420965	9.9826964	9.4594001	10.5405999	56	.5579035	.0173036
5	9.4425349	9.9826600	9.4598749	10.5401251	55	.5574651	.0173400
6	9.4429728	9.9826236	9.4603492	10.5396508	54	.5570272	.0173764
7	9.4434103	9.9825871	9.4608232	10.5391768	53	.5565897	.0174129
8	9.4438472	9.9825506	9.4612967	10.5387033	52	.5561528	.0174494
9	9.4442837	9.9825140	9.4617697	10.5382303	51	.5557163	.0174860
10	9.4447197	9.9824774	9.4622423	10.5377577	50	.5552803	.0175226
11	9.4451553	9.9824408	9.4627145	10.5372855	49	.5548447	.0175592
12	9.4455904	9.9824041	9.4631863	10.5368137	48	.5544096	.0175959
13	9.4460250	9.9823674	9.4636576	10.5363424	47	.5539750	.0176326
14	9.4464591	9.9823306	9.4641285	10.5358715	46	.5535409	.0176694
15	9.4468927	9.9822938	9.4645990	10.5354010	45	.5531073	.0177062
16	9.4473259	9.9822569	9.4650690	10.5349310	44	.5526741	.0177431
17	9.4477586	9.9822201	9.4655386	10.5344614	43	.5522414	.017779
18	9.4481909	9.9821831	9.4660078	10.5339922	42	.5518091	.017816
19	9.4486227	9.9821462	9.4664765	10.5335235	41	.5513773	.017853
20	9.4490540	9.9821092	9.4669448	10.5330552	40	.5509460	.017890
21	9.4494849	9.9820721	9.4674127	10.5325873	39	.5505151	.017927
22	9.4499153	9.9820351	9.4678802	10.5321198	38	.5500847	.017964
23	9.4503452	9.9819979	9.4683473	10.5316527	37	.5496548	.018002
24	9.4507747	9.9819608	9.4688139	10.5311861	36	.5492253	.018039
25	9.4512037	9.9819236	9.4692801	10.5307199	35	.5487963	.018076
26	9.4516322	9.9818863	9.4697459	10.5302541	34	.5483678	.018113
27	9.4520603	9.9818490	9.4702112	10.5297888	33	.5479397	.018151
28	9.4524879	9.9818117	9.4706762	10.5293238	32	.5475121	.018188
29	9.4529151	9.9817744	9.4711407	10.5288593	31	.5470849	.01822
30	9.4533418	9.9817370	9.4716048	10.5283952	30	.5466582	.01826
	Sinus. Compl.	SINVS.	Tangens. Compl.	TANG.	M		

SINVS.	Sinus. Compl.	TANG.	Tangens Compl.		Ar.com. Sinus.	Ar.com. Sin.com.
9.4533418	9.9817370	9.4716048	10,5283952	30	.5466582	.0182630
9.4537681	9.9816995	9.4720685	10,5279315	29	.5462319	.0183005
9.4541939	9.9816620	9.4725318	10,5274682	28	.5458061	.0183380
9.4546192	9.9816245	9.4729947	10,5270053	27	.5453808	.0183755
9.4550441	9.9815870	9.4734572	10,5265428	26	.5449559	.0184130
9.4554686	9.9815494	9.4739192	10,5260808	25	.5445314	.0184506
9.4558926	9.9815117	9.4743808	10,5256192	24	.5441074	.0184883
9.4563161	9.9814740	9.4748421	10,5251579	23	.5436839	.0185260
9.4567392	9.9814363	9.4753029	10,5246971	22	.5432608	.0185637
9.4571618	9.9813986	9.4757633	10,5242367	21	.5428382	.0186014
9.4575840	9.9813608	9.4762233	10,5237767	20	.5424160	.0186392
9.4580058	9.9813229	9.4766829	10,5233171	19	.5419942	.0186771
9.4584271	9.9812850	9.4771421	10,5228579	18	.5415729	.0187150
9.4588480	9.9812471	9.4776009	10,5223991	17	.5411520	.0187529
9.4592684	9.9812091	9.4780592	10,5219408	16	.5407316	.0187909
9.4596884	9.9811711	9.4785172	10,5214828	15	.5403116	.0188289
9.4601079	9.9811331	9.4789748	10,5210252	14	.5398921	.0188669
9.4605270	9.9810950	9.4794319	10,5205681	13	.5394730	.0189050
9.4609456	9.9810569	9.4798887	10,5201113	12	.5390544	.0189431
9.4613638	9.9810187	9.4803451	10,5196549	11	.5386362	.0189813
9.4617816	9.9809805	9.4808011	10,5191989	10	.5382184	.0190195
9.4621989	9.9809423	9.4812566	10,5187434	9	.5378011	.0190577
9.4626158	9.9809040	9.4817118	10,5182882	8	.5373842	.0190960
9.4630323	9.9808657	9.4821666	10,5178334	7	.5369677	.0191343
9.4634483	9.9808273	9.4826210	10,5173790	6	.5365517	.0191727
9.4638639	9.9807889	9.4830750	10,5169250	5	.5361361	.0192111
9.4642790	9.9807505	9.4835286	10,5164714	4	.5357210	.0192495
9.4646938	9.9807120	9.4839818	10,5160182	3	.5353062	.0192880
9.4651081	9.9806735	9.4844346	10,5155654	2	.5348919	.0193265
9.4655219	9.9806349	9.4848870	10,5151130	1	.5344781	.0193651
9.4659353	9.9805963	9.4853390	10,5146610	0	.5340647	.0194037
Sinus. Compl.	SINVS.	Tangens. Comple.	TANG.	M		

M	SINVS.	Sinus. Compl.	TANG.	Tangens Compl.		Ar.com. Sinus.	Ar. com. Sin.com.
0	9.4659353	9.9805963	9.4853390	10.5146610	60	.5340647	.0194037
1	9.4663483	9.9805577	9.4857907	10.5142093	59	.5336517	.0194423
2	9.4667609	9.9805190	9.4862419	10.5137581	58	.5332391	.0194810
3	9.4671730	9.9804803	9.4866928	10.5133072	57	.5328270	.0195197
4	9.4675848	9.9804415	9.4871433	10.5128567	56	.5324152	.0195585
5	9.4679960	9.9804027	9.4875933	10.5124067	55	.5320040	.0195973
6	9.4684069	9.9803639	9.4880430	10.5119570	54	.5315931	.0196361
7	9.4688173	9.9803250	9.4884924	10.5115076	53	.5311827	.0196750
8	9.4692273	9.9802860	9.4889413	10.5110587	52	.5307727	.0197140
9	9.4696369	9.9802471	9.4893898	10.5106102	51	.5303631	.0197529
10	9.4700461	9.9802081	9.4898380	10.5101620	50	.5299539	.0197919
11	9.4704548	9.9801690	9.4902858	10.5097142	49	.5295452	.0198310
12	9.4708631	9.9801299	9.4907332	10.5092668	48	.5291369	.0198701
13	9.4712710	9.9800908	9.4911802	10.5088198	47	.5287290	.0199092
14	9.4716785	9.9800516	9.4916269	10.5083731	46	.5283215	.0199484
15	9.4720856	9.9800124	9.4920731	10.5079269	45	.5279144	.0199876
16	9.4724922	9.9799732	9.4925190	10.5074810	44	.5275078	.0200268
17	9.4728985	9.9799339	9.4929646	10.5070354	43	.5271015	.0200661
18	9.4733043	9.9798946	9.4934097	10.5065903	42	.5266957	.0201054
19	9.4737097	9.9798552	9.4938545	10.5061455	41	.5262903	.0201448
20	9.4741146	9.9798158	9.4942988	10.5057012	40	.5258854	.0201842
21	9.4745192	9.9797764	9.4947429	10.5052571	39	.5254808	.0202236
22	9.4749234	9.9797369	9.4951865	10.5048135	38	.5250766	.0202631
23	9.4753271	9.9796973	9.4956298	10.5043702	37	.5246729	.0203027
24	9.4757304	9.9796578	9.4960727	10.5039273	36	.5242696	.0203422
25	9.4761334	9.9796182	9.4965152	10.5034848	35	.5238666	.0203818
26	9.4765359	9.9795785	9.4969574	10.5030426	34	.5234641	.0204215
27	9.4769380	9.9795388	9.4973991	10.5026009	33	.5230620	.0204612
28	9.4773396	9.9794991	9.4978406	10.5021594	32	.5226604	.0205009
29	9.4777409	9.9794593	9.4982816	10.5017184	31	.5222591	.0205407
30	9.4781418	9.9794195	9.4987223	10.5012777	30	.5218582	.0205805
	Sinus. Compl.	SINVS.	Tangens Comple.	TANG.	M		

17 grad.

SINVS.	Sinus Compl.	TANG.	Tangens Compl.		Ar. com. Sinus.	Ar. Com Sin.com.
9.4781418	9.9794195	9.4987223	10.5012777	30	.5218582	.0205805
9.4785423	9.9793796	9.4991626	10.5008374	29	.5214577	.0206204
9.4789423	9.9793398	9.4996026	10.5003974	28	.5210577	.0206602
9.4793420	9.9792998	9.5000422	10.4999578	27	.5206580	.0207002
9.4797412	9.9792599	9.5004814	10.4995186	26	.5202588	.0207402
9.4801401	9.9792198	9.5009203	10.4990797	25	.5198599	.0207802
9.4805385	9.9791798	9.5013588	10.4986412	24	.5194615	.0208202
9.4809366	9.9791397	9.5017969	10.4982031	23	.5190634	.0208603
9.4813342	9.9790996	9.5022347	10.4977653	22	.5186658	.0209004
9.4817315	9.9790594	9.5026721	10.4973279	21	.5182685	.0209406
9.4821283	9.9790192	9.5031092	10.4968908	20	.5178717	.0209808
9.4825248	9.9789789	9.5035459	10.4964541	19	.5174752	.0210211
9.4829208	9.9789386	9.5039822	10.4960178	18	.5170792	.0210614
9.4833165	9.9788983	9.5044182	10.4955818	17	.5166835	.0211017
9.4837117	9.9788580	9.5048538	10.4951462	16	.5162883	0211421
9.4841066	9.9788175	9.5052891	10.4947109	15	.5158934	.0211825
9.4845010	9.9787770	9.5057240	10.4942760	14	.5154990	.0212230
9.4848951	9.9787365	9.5061586	10.4938414	13	.5151049	.0212635
9.4852888	9.9786960	9.5065928	10.4934072	12	.5147112	.0213040
9.4856820	9.9786554	9.5070267	10.4929733	11	.5143180	.0213446
9.4860749	9.9786148	9.5074602	10.4925398	10	.5139251	.0213852
9.4864674	9.9785741	9.5078933	10.4921067	9	.5135326	.0214259
9.4868595	9.9785334	9.5083261	10.4916739	8	.5131405	.0214666
9.4872512	9.9784927	9.5087586	10.4912414	7	.5127488	.0215073
9.4876426	9.9784519	9.5091907	10.4908093	6	.5123574	0215481
9.4880335	9.9784111	9.5096224	10.4903776	5	.5119665	.0215889
9.4884240	9.9783702	9.5100539	10.4899461	4	.5115760	.0216298
9.4888142	9.9783293	9.5104849	10.4895151	3	.5111858	.0216707
9.4892040	9.9782883	9.5109156	10.4890844	2	.5107960	.0217117
9.4895934	9.9782474	9.5113460	10.4886540	1	.5104066	.0217526
9.4899824	9.9782063	9.5117460	10.4882240	0	.5100176	.0217937
SINVS.	Sinus. Compl.	Tangens Compl.	TANG.	M		

72 grad.

18 grad.

M	SINVS.	Sinus Compl.	TANG.	Tangens Compl.		Ar. com. Sinus.	Ar.Com Sin.com.
0	9.4899824	9.9782063	9.5117760	10.4882240	60	.5100176	0217397
1	9.4903710	9.9781653	9.5122057	10.4877943	59	.5096290	.0218347
2	9.4907592	9.9781241	9.5126351	10.4873649	58	.5092408	.0218759
3	9.4911471	9.9780830	9.5130641	10.4869359	57	.5088529	.0219170
4	9.4915345	9.9780418	9.5134927	10.4865073	56	.5084655	.0219582
5	9.4919216	9.9780006	9.5139210	10.4860790	55	.5080784	.0219994
6	9.4923083	9.9779593	9.5143490	10.4856510	54	.5076917	.0220407
7	9.4926946	9.9779180	9.5147766	10.4852234	53	.5073054	.0220820
8	9.4930806	9.9778766	9.5152039	10.4847961	52	.5069194	.0221234
9	9.4934661	9.9778353	9.5156309	10.4843691	51	.5065339	.0221647
10	9.4938513	9.9777938	9.5160575	10.4839425	50	.5061487	.0222062
11	9.4942361	9.9777523	9.5164838	10.4835162	49	.5057639	.0222477
12	9.4946205	9.9777108	9.5169097	10.4830903	48	.5053795	.0222892
13	9.4950046	9.9776693	9.5173353	10.4826647	47	.5049954	.0223307
14	9.4953883	9.9776277	9.5177606	10.4822394	46	.5046117	.0223723
15	9.4957716	9.9775860	9.5181855	10.4818145	45	.5042284	.0224140
16	9.4961545	9.9775444	9.5186101	10.4813899	44	.5038455	.0224556
17	9.4965370	9.9775026	9.5190344	10.4809656	43	.5034630	.0224974
18	9.4969192	9.9774609	9.5194583	10.4805417	42	.5030808	.0225391
19	9.4973010	9.9774191	9.5198819	10.4801181	41	.5026990	.0225809
20	9.4976824	9.9773772	9.5203052	10.4796948	40	.5023176	.0226228
21	9.4980635	9.9773354	9.5207282	10.4792718	39	.5019365	.0226646
22	9.4984442	9.9772934	9.5211508	10.4788492	38	.5015558	.0227066
23	9.4988245	9.9772515	9.5215730	10.4784270	37	.5011755	.0227485
24	9.4992045	9.9772095	9.5219950	10.4780050	36	.5007955	.0227905
25	9.4995840	9.9771674	9.5224166	10.4775834	35	.5004160	.0228326
26	9.4999633	9.9771253	9.5228379	10.4771621	34	.5000367	.0228747
27	9.5003421	9.9770832	9.5232589	10.4767411	33	.4996579	.0229168
28	9.5007206	9.9770410	9.5236795	10.4763205	32	.4992794	.0229590
29	9.5010987	9.9769988	9.5240999	10.4759001	31	.4989013	.0230012
30	9.5014764	9.9769566	9.5245199	10.4754801	30	.4985236	.0230434
	SINVS.	Sinus. Compl.	Tangens Compl.	TANG.	M		

71 grad.

18 grad.

SINVS.	Sinus Compl.	TANG.	Tangens, Compl.		Ar.com. Sinus.	Ar.com. Sin com.
9.5014764	9.9769566	9.5245199	10.4754801	30	.4985236	.0230434
9.5018538	9.9769143	9.5249395	10.4750605	29	.4981462	.0230857
9.5022308	9.9768720	9.5253589	10.4746411	28	.4977692	.0231280
9.5026075	9.9768296	9.5257779	10.4742221	27	.4973925	.0231704
9.5039838	9.9767872	9.5261966	10.4738034	26	.4970162	.0232128
9.5033597	9.9767447	9.5266150	10.4733850	25	.4966403	.0232553
9.5037353	9.9767022	9.5270331	10.4729669	24	.4962647	.0232978
9.5041105	9.9766597	9.5274508	10.4725492	23	.4958895	.0233403
9.5044853	9.9766171	9.5278682	10.4721318	22	.4955147	.0233829
9.5048598	9.9765745	9.5282853	10.4717147	21	.4951402	.0234255
9.5052339	9.9765318	9.5287021	10.4712979	20	.4947661	.0234682
9.5056077	9.9764891	9.5291186	10.4708814	19	.4943923	.0235109
9.5059811	9.9764464	9.5295347	10.4704653	18	.4940189	.0235536
9.5063542	9.9764036	9.5299505	10.4700495	17	.4936458	.0235964
9.5067269	9.9763608	9.5303661	10.4696339	16	.4932731	.0236392
9.5070992	9.9763179	9.5307813	10.4692187	15	.4929008	.0236820
9.5074712	9.9762750	9.5311961	10.4688039	14	.4925288	.0237250
9.5078428	9.9762321	9.5316107	10.4683893	13	.4921572	.0237679
9.5082141	9.9761891	9.5320250	10.4679750	12	.4917859	.0238109
9.5085850	9.9761461	9.5324389	10.4675611	11	.4914150	.0238539
9.5089556	9.9761030	9.5328526	10.4671474	10	.4910444	.0238970
9.5093258	9.9760599	9.5332659	10.4667341	9	.4906742	.0239401
9.5096956	9.9760167	9.5336789	10.4663211	8	.4903044	.0239833
9.5100651	9.9759736	9.5340916	10.4659084	7	.4899349	.0240264
9.5104343	9.9759303	9.5345040	10.4654960	6	.4895657	.0240697
9.5108031	9.9758870	9.5349161	10.4650839	5	.4891969	.0241130
9.5111716	9.9758437	9.5353278	10.4646722	4	.4888284	.0241563
9.5115397	9.9758004	9.5357393	10.4642607	3	.4884603	.0241996
9.5119074	9.9757570	9.5361505	10.4638495	2	.4880926	.0242430
9.5122749	9.9757135	9.5365613	10.4634387	1	.4877251	.0242865
9.5126419	9.9756701	9.5369719	10.4630281	0	.4873581	.0243299
Sinus Compl.	SINVS.	Tangens Compl.	TANG.	M		

grad. 71

19 grad.

M	SINVS.	Sinus Compl.	TANG.	Tangens, Compl.		Ar.com. Sinus.	Ar.com. Sin com.
0	9.5126419	9.9756701	9.5369719	10.4630281	60	.4873581	.0243299
1	9.5130086	9.975626	9.5373821	10.4626179	59	.4869914	.024373
2	9.5133750	9.9755830	9.5377920	10.4622080	58	.4866250	.024417
3	9.5137410	9.9755394	9.5382017	10.4617983	57	.4862590	.0244606
4	9.5141067	9.9754957	9.5386110	10.4613890	56	.4858933	.0245043
5	9.5144721	9.975452	9.5390200	10.4609800	55	.4855279	.024547
6	9.5148371	9.9754083	9.5394287	10.4605713	54	.4851629	.0245917
7	9.5152017	9.9753646	9.5398371	10.4601629	53	.4847983	.0246354
8	9.5155660	9.9753208	9.5402453	10.4597547	52	.4844340	.0246792
9	9.5159300	9.9752769	9.5406531	10.4593469	51	.4840700	.0247231
10	9.5162936	9.975233	9.5410606	10.4589394	50	.4837064	.0247670
11	9.5166569	9.975189	9.5414678	10.4585322	49	.4833431	.0248109
12	9.5170198	9.9751451	9.5418747	10.4581253	48	.4829802	.0248549
13	9.5173824	9.975101	9.5422813	10.4577187	47	.4826176	.0248989
14	9.5177447	9.9750570	9.5426877	10.4573123	46	.4822553	.0249430
15	9.5181066	9.9750129	9.5430937	10.4569063	45	.4818934	.0249871
16	9.5184682	9.9749688	9.5434994	10.4565096	44	.4815318	.0250312
17	9.5188295	9.9749246	9.5439048	10.4560952	43	.4811705	.0250754
18	9.5191904	9.9748804	9.5443100	10.4556900	42	.4808096	.0251196
19	9.5195510	9.974836	9.5447148	10.4552852	41	.4804490	.0251639
20	9.5199112	9.9747918	9.5451193	10.4548807	40	.4800888	.0252082
21	9.5202711	9.9747475	9.5455236	10.4544764	39	.4797289	.0252525
22	9.5206307	9.9747031	9.5459276	10.4540724	38	.4793693	.0252969
23	9.5209899	9.9746587	9.546331	10.4536688	37	.4790101	.0253413
24	9.5213488	9.9746142	9.5467346	10.4532654	36	.4786512	.0253858
25	9.5217074	9.9745697	9.5471377	10.4528623	35	.4782926	.0254303
26	9.5220656	9.9745251	9.5475405	10.4524595	34	.4779344	.0254748
27	9.5224235	9.9744806	9.547943	10.4520570	33	.4775765	.0255194
28	9.5227811	9.9744359	9.5483452	10.4516548	32	.4772189	.0255641
29	9.5231383	9.9743913	9.5487471	10.4512529	31	.4768617	.0256087
30	9.52340	9.974340	9.5491487	10.4508513	30	.4765047	.0256534
	Sinus Compl.	SINVS.	Tangens Compl.	TANG.	M		

70 grad.

19 grad.

SINVS.	Sinus Compl.	TANG.	Tangens. Compl.		Ar.com. Sinus	Ar.com. Sin.com.
9.5234953	9.9743466	9.5491487	10.4508513	30	.4765047	.0256534
9.5238518	9.9743018	9.5495500	10.4504500	29	.4761482	.0256982
9.5242081	9.9742570	9.5499511	10.4500489	28	.4757919	.0257430
9.5245640	9.9742122	9.5503519	10.4496481	27	.4754360	.0257878
9.5249196	9.9741673	9.5507523	10.4492477	26	.4750804	.0258327
9.5252749	9.9741224	9.5511525	10.4488475	25	.4747251	.0258776
9.5256298	9.9740774	9.5515524	10.4484476	24	.4743702	.0259226
9.5259844	9.9740324	9.5519521	10.4480479	23	.4740156	.0259676
9.5263387	9.9739873	9.5523514	10.4476486	22	.4736613	.0260127
9.5266927	9.9739422	9.5527504	10.4472496	21	.4733073	.0260578
9.5270463	9.9738971	9.5531492	10.4468508	20	.4729537	.0261029
9.5273997	9.9738519	9.5535477	10.4464523	19	.4726003	.0261481
9.5277526	9.9738067	9.5539459	10.4460541	18	.4722474	.0261933
9.5281053	9.9737615	9.5543438	10.4456562	17	.4718947	.0262385
9.5284577	9.9737162	9.5547415	10.4452585	16	.4715423	.0262838
9.5288097	9.9736709	9.5551388	10.4448612	15	.4711903	.0263291
9.5291614	9.9736255	9.5555359	10.4444641	14	.4708386	.0263745
9.5295128	9.9735801	9.5559327	10.4440673	13	.4704872	.0264199
9.5298638	9.9735346	9.5563292	10.4436708	12	.4701362	.0264654
9.5302146	9.9734891	9.5567255	10.4432745	11	.4697854	.0265109
9.5305650	9.9734435	9.5571214	10.4428786	10	.4694350	.0265565
9.5309151	9.9733980	9.5575171	10.4424829	9	.4690849	.0266020
9.5312649	9.9733523	9.5579125	10.4420875	8	.4687351	.0266477
9.5316143	9.9733067	9.5583077	10.4416923	7	.4683857	.0266933
9.5319635	9.9732610	9.5587025	10.4412975	6	.4680365	.0267390
9.5323123	9.9732152	9.5590971	10.4409029	5	.4676877	.0267848
9.5326608	9.9731694	9.5594914	10.4405086	4	.4673392	.0268306
9.5330090	9.9731236	9.5598854	10.4401146	3	.4669910	.0268764
9.5333569	9.9730777	9.5602792	10.4397208	2	.4656431	.0269223
9.5337044	9.9730318	9.5606727	10.4393273	1	.4662956	.0269682
9.5340517	9.9729858	9.5610659	10.438934	0	.4659483	.0270142
Sinus. Compl.	SNVS.	Tangens Compl.	TANG.	M		

70 grad.

20 grad.

M	SINVS.	Sinus Compl.	TANG.	Tangens. Compl.		Ar.com. Sinus	Ar.com. Sin.com.
0	9.5340517	9.9729858	9.5610659	10.4389341	60	.4659483	.0270142
1	9.5343986	9.9729398	9.5614588	10.4385412	59	.4656014	.0270602
2	9.5347452	9.9728938	9.5618515	10.4381485	58	.4652548	.0271062
3	9.5350915	9.9728477	9.5622439	10.4377561	57	.4649085	.0271523
4	9.5354375	9.9728016	9.5626360	10.4373640	56	.4645625	.0271984
5	9.5357832	9.9727554	9.5630278	10.4369722	55	.4642168	.0272446
6	9.5361286	9.9727092	9.5634194	10.4365806	54	.4638714	.0272908
7	9.5364737	9.9726629	9.5638107	10.4361893	53	.4635263	.0273371
8	9.5368184	9.9726166	9.5642018	10.4357982	52	.4631816	.0273834
9	9.5371628	9.9725703	9.5645925	10.4354075	51	.4628372	.0274297
10	9.5375070	9.9725239	9.5649831	10.4350169	50	.4624930	.0274761
11	9.5378508	9.9724775	9.5653733	10.4346267	49	.4621492	.0275225
12	9.5381943	9.9724310	9.5657633	10.4342367	48	.4618057	.0275690
13	9.5385375	9.9723845	9.5661530	10.4338470	47	.4614625	.0276155
14	9.5388804	9.9723380	9.5665424	10.4334576	46	.4611196	.0276620
15	9.5392230	9.9722914	9.5669316	10.4330684	45	.4607770	.0277086
16	9.5395653	9.9722448	9.5673205	10.4326795	44	.4604347	.0277552
17	9.5399073	9.9721981	9.5677091	10.4322909	43	.4600927	.0278019
18	9.5402489	9.9721514	9.5680975	10.4319025	42	.4597511	.0278486
19	9.5405903	9.9721047	9.5684856	10.4315144	41	.4594097	.0278953
20	9.5409314	9.9720579	9.5688735	10.4311265	40	.4590686	.0279421
21	9.5412721	9.9720110	9.5692611	10.4307389	39	.4587279	.0279890
22	9.5416126	9.9719642	9.5696484	10.4303516	38	.4583874	.0280358
23	9.5419527	9.9719172	9.5700355	10.4299645	37	.4580473	.0280828
24	9.5422926	9.9718703	9.5704223	10.4295777	36	.4577074	.0281297
25	9.5426321	9.9718233	9.5708088	10.4291912	35	.4573679	.0281767
26	9.5429713	9.9717762	9.5711951	10.4288049	34	.4570287	.0282238
27	9.5433103	9.9717291	9.5715811	10.4284189	33	.4566897	.0282709
28	9.5436489	9.9716820	9.5719669	10.4280331	32	.4563511	.0283180
29	9.5439873	9.9716348	9.5723524	10.4276476	31	.4560127	.0283652
30	9.5443253	9.9715876	9.5727377	10.4272623	30	.4556747	.0284124
	Sinus Compl.	SNVS.	Tangens Compl.	TANG.	M		

69 grad.

20 grad.

SINVS.	Sinus. Compl.	TANG.	Tangens Compl.		Ar.com. Sinus.	Ar. com. Sin.com.
9,5443253	9.9715876	9.5727377	10,4272623	30	.4556747	.0284124
9,5446630	9.9715404	9.5731227	10,4268773	29	.4553370	.0284596
9,5450005	9.9714931	9.5735074	10,4264926	28	.4549995	.0285069
9,5453376	9.9714457	9.5738919	10,4261081	27	.4546624	.0285543
9,5456745	9.9713984	9.5742761	10,4257239	26	.4543255	.0286016
9,5460110	9.9713509	9.5746601	10,4253399	25	.4539890	.0286491
9,5463472	9.9713035	9.5750438	10,4249562	24	.4536528	.0286965
9,5466832	9.9712560	9.5754272	10,4245728	23	.4533168	.0287440
9,5470189	9.9712084	9.5758104	10,4241896	22	.4529811	.0287916
9,5473542	9.9711608	9.5761934	10,4238066	21	.4526458	.0288392
9,5476893	9.9711132	9.5765761	10,4234239	20	.4523107	.0288868
9,5480240	9.9710655	9.5769585	10,4230415	19	.4519760	.0289345
9,5483585	9.9710178	9.5773407	10,4226593	18	.4516415	.0289822
9,5486927	9.9709701	9.5777226	10,4222774	17	.4513073	.0290299
9,5490266	9.9709223	9.5781043	10,4218957	16	.4509734	.0290777
9,5493602	9.9708744	9.5784858	10,4215142	15	.4506398	.0291256
9,5496935	9.9708265	9.5788669	10,4211331	14	.4503065	.0291735
9,5500265	9.9707786	9.5792479	10,4207521	13	.4499735	.0292214
9,5503592	9.9707306	9.5796286	10,4203714	12	.4496408	.0292694
9,5506916	9.9706826	9.5800090	10,4199910	11	.4493084	.0293174
9,5510237	9.9706346	9.5803892	10,4196108	10	.4489763	.0293654
9,5513556	9.9705865	9.5807691	10,4192309	9	.4486444	.0294135
9,5516871	9.9705383	9.5811488	10,4188512	8	.4483129	.0294617
9,5520184	9.9704902	9.5815282	10,4184718	7	.4479816	.0295098
9,5523494	9.9704419	9.5819074	10,4180926	6	.4476506	.0295581
9,5526801	9.9703937	9.5822864	10,4177136	5	.4473199	.0296063
9,5530105	9.9703454	9.5826651	10,4173349	4	.4469895	.0296546
9,5533406	9.9702970	9.5830435	10,4169565	3	.4466594	.0297030
9,5536704	9.9702486	9.5834217	10,4165783	2	.4463296	.0297514
9,5539999	9.9702002	9.5837997	10,4162003	1	.4460001	.0297998
9,5543292	9.9701517	9.5841774	10,4158226	0	.4456708	.0298483
Sinus. Compl.	SINVS.	Tangens Compl.	TANG.	M		

69 grad.

M	SINVS.	Sinus. Compl.	TANG.	Tangens Compl.		Ar.com. Sinus.	Ar.com Sin.com
0	9.5543292	9.9701517	9.5841774	10.4158226	60	.4456708	,029848
1	9.5546581	9.9701032	9.5845549	10.4154451	59	.4453419	029896
2	9.5549868	9.9700547	9.5849321	10.4150679	58	.4450132	,029945
3	9.5553152	9.9700061	9.5853091	10.4146909	57	.4446848	,029993
4	9.5556433	9.9699574	9.5856859	10.4143141	56	.4443567	,030042
5	9.5559711	9.9699087	9.5860624	10.4139376	55	.4440289	,030091
6	9.5562989	9.9698600	9.5864386	10.4135614	54	.4437013	,030140
7	9.5566259	9.9698112	9.5868147	10.4131853	53	.4433741	,030188
8	9.5569529	9.9697624	9.5871904	10.4128096	52	.4430471	,030237
9	9.5572796	9.9697136	9.5875660	10.4124340	51	.4427204	,030286
10	9.5576060	9.9696647	9.5879413	10.4120587	50	.4423940	,030335
11	9.5579321	9.9696158	9.5883163	10.4116837	49	.4420679	,030384
12	9.5582579	9.9695668	9.5886912	10.4113088	48	.4417421	,030433
13	9.5585835	9.9693177	9.5890657	10.4109343	47	.4414165	,030485
14	9.5589088	9.9694687	9.5894401	10.4105599	46	.4410912	,030531
15	9.5592338	9.9694196	9.5898142	10.4101858	45	.4407662	,030580
16	9.5595585	9.9693704	9.5901881	10.4098119	44	.4404415	,030629
17	9.5598829	9.9693212	9.5905617	10.4094383	43	.4401171	,030678
18	9.5602071	9.9692720	9.5909351	10.4090649	42	.4397929	,030728
19	9.5605310	9.9692227	9.5913082	10.4086918	41	.4394690	,030777
20	9.5608546	9.9691734	9.5916812	10.4083188	40	.4391454	,030826
21	9.5611779	9.9691241	9.5920539	10.4079461	39	.4388221	,030875
22	9.5615010	9.9690746	9.5924263	10.4075737	38	.4384990	,030925
23	9.5618237	9.9690252	9.5927985	10.4072015	37	.4381763	,030974
24	9.5621462	9.9689757	9.5931705	10.4068295	36	.4378538	,031024
25	9.5624685	9.9689262	9.5935423	10.4064577	35	.4375315	,031073
26	9.5627904	9.9688766	9.5939138	10.4060862	34	.4372096	,031123
27	9.5631121	9.9688270	9.5942851	10.4057149	33	.4368879	,031173
28	9.5634335	9.9687773	9.5946561	10.4053439	32	.4365665	,031222
29	9.5637546	9.9687276	9.5950269	10.4049731	31	.4362454	,031272
30	9.5640754	9.9686779	9.5953975	10.4046025	30	.4359246	,031322
	Sinus Compl.	SINVS.	Tangens Compl.	TANG.	M		

21 grad.

SINVS.	Sinus Compl.	TANG.	Tangens Compl.		Ar.com. Sinus.	Ar.com. Sin.com.
9.5640754	9.9686779	9.5953975	10.4046025	30	.4359246	.0313221
9.5643960	9.9686281	9.5957679	10.4042321	29	.4356040	.0313719
9.5647163	9.9685783	9.5961380	10.4038620	28	.4352837	.0314217
9.5650363	9.9685284	9.5965079	10.4034921	27	.4349637	.0314716
9.5653561	9.9684785	9.5968776	10.4031224	26	.4346439	.0315215
9.5656756	9.9684286	9.5972470	10.4027530	25	.4343244	.0315714
9.5659948	9.9683786	9.5976162	10.4023838	24	.4340052	.0316214
9.5663137	9.9683285	9.5979852	10.4020148	23	.4336863	.0316715
9.5666324	9.9682784	9.5983540	10.4016460	22	.4333676	.0317216
9.5669508	9.9682283	9.5987225	10.4012775	21	.4330492	.0317717
9.5672689	9.9681781	9.5990908	10.4009092	20	.4327311	.0318219
9.5675868	9.9681279	9.5994588	10.4005412	19	.4324132	.0318721
9.5679044	9.9680777	9.5998267	10.4001733	18	.4320956	.0319223
9.5682217	9.9680274	9.6001943	10.3998057	17	.4317783	.0319726
9.5685387	9.9679771	9.6005617	10.3994383	16	.4314613	.0320229
9.5688555	9.9679267	9.6009289	10.3990711	15	.4311445	.0320733
9.5691721	9.9678763	9.6012958	10.3987042	14	.4308279	.0321237
9.5694883	9.9678258	9.6016625	10.3983375	13	.4305117	.0321742
9.5698043	9.9677753	9.6020290	10.3979710	12	.4301957	.0322247
9.5701200	9.9677247	9.6023953	10.3976047	11	.4298800	.0322753
9.5704355	9.9676741	9.6027613	10.3972387	10	.4295645	.0323259
9.5707506	9.9676235	9.6031271	10.3968729	9	.4292494	.0323765
9.5710656	9.9675728	9.6034937	10.3965073	8	.4289344	.0324272
9.5713802	9.9675221	9.6038581	10.3961419	7	.4286198	.0324779
9.5716946	9.9674713	9.6042233	10.3957767	6	.4283054	.0325287
9.5720087	9.9674205	9.6045882	10.3954118	5	.4279913	.0325795
9.5723226	9.9673697	9.6049529	10.3950471	4	.4276774	.0326303
9.5726362	9.9673188	9.6053174	10.3946826	3	.4273638	.0326812
9.5729495	9.9672679	9.6056817	10.3943183	2	.4270505	.0327321
9.5732626	9.9672169	9.6060457	10.3939543	1	.4267374	.0327831
9.5735754	9.9671659	9.6064096	10.3935904	0	.4264246	.0328341
Sinus. Compl.	SINVS.	Tangens Compl.	TANG.	M		

68 grad.

M	SINVS.	Sinus Compl.	TANG.	Tangens Compl.		Ar.com. Sinus.	Ar.com. Sin.com.
0	9.5735754	9.9671659	9.6064096	10.3935904	60	.4264246	,0328341
1	9.5738880	9.9671148	9.6067732	10,3932268	59	.4261120	,0328852
2	9.5742003	9.9670637	9.6071366	10,3928634	58	.4257997	,0329363
3	9.5745123	9.9670125	9.6074997	10,3925003	57	.4254877	,0329875
4	9.5748240	9.9669614	9.6078627	10,3921373	56	.4251760	,0330386
5	9.5751356	9.9669101	9.6082254	10,3917746	55	.4248644	,0330899
6	9.5754468	9.9668588	9.6085880	10,3914120	54	.4245532	,0331412
7	9.5757578	9.9668075	9.6089503	10,3910497	53	.4242422	,0331925
8	9.5760685	9.9667562	9.6093124	10,3906876	52	.4239315	,0332438
9	9.5763790	9.9667048	9.6096742	10,3903258	51	.4236210	,0332952
10	9.5766892	9.9666533	9.6100359	10,3899641	50	.4233108	,0333467
11	9.5769991	9.9666018	9.6103973	10,3896027	49	.4230009	,0333982
12	9.5773088	9.9665503	9.6107586	10,3892414	48	.4226912	,0334497
13	9.5776183	9.9664987	9.6111196	10,3888804	47	.4223817	,0335013
14	9.5779275	9.9664471	9.6114804	10,3885196	46	.4220725	,0335529
15	9.5782364	9.9663954	9.6118409	10,3881591	45	.4217636	,0336046
16	9.5785450	9.9663437	9.6122013	10,3877987	44	.4214550	,0336563
17	9.5788535	9.9662920	9.6125615	10,3874385	43	.4211465	,0337080
18	9.5791616	9.9662402	9.6129214	10,3870786	42	.4208384	,0337598
19	9.5794695	9.9661884	9.6132812	10,3867188	41	.4205305	,0338116
20	9.5797772	9.9661365	9.6136407	10,3863593	40	.4202228	,0338635
21	9.5800845	9.9660846	9.6140000	10,3860000	39	.4199155	,0339154
22	9.5803917	9.9660326	9.6143591	10*3856409	38	.4196083	,0339674
23	9.5806986	9.9659806	9.6147180	10,3852820	37	.4193014	,0340194
24	9.5810052	9.9659285	9.6150766	10,3849234	36	.4189948	,0340715
25	9.5813116	9.9658764	9.6154351	10,3845649	35	.4186884	,0341236
26	9.5816177	9.9658243	9.6157934	10,3842066	34	.4183823	,0341757
27	9.5819236	9.9657721	9.6161514	10,3838486	33	.4180764	,0342279
28	9.5822292	9.9657199	9*6165093	10,3834907	32	.4177708	,0342801
29	9.5825345	9.9656677	9.6168669	10,3831331	31	.4174655	,0343323
30	9.5828397	9.9656153	9.6172243	10,3827757	30	.4171603	,0343847
	Sinus. Compl.	SINVS.	Tangens Compl.	TANG.	M		

22 grad.

SINVS.	Sinus Compl.	TANG.	Tangens Compl.		Ar.Com Sinus.	Ar.com. Sin.com.
9.5828397	9.9656153	9.6172243	10.3827757	30	.4171603	.0343847
9.5831445	9.9655630	9.6175815	10.3824185	29	.4168555	.0344370
9.5834491	9.9655106	9.6179385	10.3820615	28	.4165509	.0344894
9.5837535	9.9654582	9.6182953	10.3817047	27	.4162465	.0345418
9.5840576	9.9654057	9.6186519	10.3813481	26	.4159424	.0345943
9.5843615	9.9653532	9.6190083	10.3809917	25	.4156385	.0346468
9.5846651	9.9653006	9.6193645	10.3806355	24	.4153349	.0346994
9.5849685	9.9652480	9.6197205	10.3802795	23	.4150315	.0347520
9.5852716	9.9651953	9.6200762	10.3799238	22	.4147284	.0348047
9.5855745	9.9651426	9.6204318	10.3795682	21	.4144255	.0348574
9.5858771	9.9650899	9.6207872	10.3792128	20	.4141229	.0349101
9.5861795	9.9650371	9.6211423	10.3788577	19	.4138205	.0349629
9.5864816	9.9649843	9.6214973	10.3785027	18	.4135184	.0350157
9.5867835	9.9649314	9.6218520	10.3781480	17	.4132165	.0350686
9.5870851	9.9648785	9.6222066	10.3777934	16	.4129149	.0351215
9.5873865	9.9648256	9.6225609	10.3774391	15	.4126135	.0351744
9.5876876	9.9647726	9.6229150	10.3770850	14	.4123124	.0352274
9.5879885	9.9647195	9.6232690	10.3767310	13	.4120115	.0352805
9.5882892	9.9646665	9.6236227	10.3763773	12	.4117108	.0353335
9.5885896	9.9646133	9.6239763	10.3760237	11	.4114104	.0353867
9.5888897	9.9645602	9.6243296	10.3756704	10	.4111103	.0354398
9.5891897	9.9645069	9.6246827	10.3753173	9	.4108103	.0354931
9.5894893	9.9644537	9.6250356	10.3749644	8	.4105107	.0355463
9.5897888	9.9644004	9.6253884	10.3746116	7	.4102112	.0355996
9.5900880	9.9643470	9.6257409	10.3742591	6	.4099120	.0356530
9.5903869	9.9642937	9.6260932	10.3739068	5	.4096131	.0357063
9.5906856	9.9642402	9.6264454	10.3735546	4	.4093144	.0357598
9.5909841	9.9641868	9.6267973	10.3732027	3	.4090159	.0358132
9.5912823	9.9641332	9.6271491	10.3728509	2	.4087177	.0358668
9.5915803	9.9640797	9.6275006	10.3724994	1	.4084197	.0359203
9.5918780	9.9640261	9.6278519	10.3721481	0	.4081220	.0359739
Sinus Compl.	SINVS.	Tangens Compl.	TANG.	M		

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M	SINVS.	Sinus Compl.	TANG.	Tangens Compl.		Ar. Com Sinus.	Ar. Com. Sin. com.
0	9.5918780	9.9640261	9.6278519	10,3721481	60	.4081220	.0359739
1	9.5921755	9.9639724	9.6282031	10,3717969	59	.4078245	.0360276
2	9.5924728	9.9639187	9.6285540	10,3714460	58	.4075272	.0360813
3	9.5927698	9.9638650	9.6289048	10,3710952	57	.4072302	.0361350
4	9.5930666	9.9638112	9.6292553	10,3707447	56	.4069334	.03618[illegible]
5	9.5933631	9.9637574	9.6296057	10,3703943	55	.4066369	.036242[illegible]
6	9.5936594	9.9637036	9.6299558	10,3700442	54	.4063406	.036296[illegible]
7	9.5939555	9.9636496	9.6303058	10,3696942	53	.4060445	.036350[illegible]
8	9.5942513	9.9635957	9.6306556	10,3693444	52	.4057487	.036404[illegible]
9	9.5945469	9.9635417	9.6310052	10,3689948	51	.4054531	.036458[illegible]
10	9.5948422	9.9634877	9.6313545	10,368[illegible]55	50	.4051578	.036512[illegible]
11	9.5951373	9.9634336	9.6317037	10,3682963	49	.4048627	.036566[illegible]
12	9.5954322	9.9633795	9.6320527	10,3679473	48	.4045678	.036620[illegible]
13	9.5957268	9.9633253	9.6324015	10,3675985	47	.4042732	.036674[illegible]
14	9.5960212	9.9632711	9.6327501	10,3672499	46	.4039788	.036728[illegible]
15	9.5963154	9.9632168	9.6330985	10,3669015	45	.4036846	.036783[illegible]
16	9.5966093	9.9631625	9.6334468	10,3665532	44	.4033907	.0368375
17	9.5969030	9.9631082	9.6337948	10,3662052	43	.4030970	.0368918
18	9.5971965	9.9630538	9.6341426	10,3658574	42	.4028035	.036946[illegible]
19	9.5974897	9.9629994	9.6344903	10,3655097	41	.4025103	.0370006
20	9.5977827	9.9629449	9.6348378	10,3651622	40	.4022173	.0370551
21	9.5980754	9.9628904	9.6351850	10,3648150	39	.4019246	.037109[illegible]
22	9.5983679	9.9628358	9.6355321	10,3644679	38	.4016321	.037164[illegible]
23	9.5986602	9.9627812	9.6358790	10,3641210	37	.4013398	.037218[illegible]
24	9.5989523	9.9627266	9.6362257	10,3637743	36	.4010477	.037273[illegible]
25	9.5992441	9.9626719	9.6365722	10,3634278	35	.4007559	.0373281
26	9.5995357	9.9626172	9.6369185	10,3630815	34	.4004643	.037382[illegible]
27	9.5998270	9.9625624	9.6372646	10,3627354	33	.4001730	.037437[illegible]
28	9.6001181	9.9625076	9.6376106	10,3623894	32	.3998819	.037491[illegible]
29	9.6004090	9.9624527	9.6379563	10,3620437	31	.3995910	.037547[illegible]
30	9.6006997	9.9623978	9.6383019	10,3616981	30	.3993003	.03760[illegible]
	Sinus Compl.	SINVS.	Tangens Compl.	TANG.	M		

SINVS.	Sinus Compl.	TANG.	Tangens Compl.		Ar.Com Sinus.	Ar.com Sin.com.
9.6006997	9.9623978	9.6383019	10.3616981	30	.3993003	.0376022
9.6009901	9.9623428	9.6386473	10.3613527	29	.3990099	.0376572
9.6012803	9.9622878	9.6389925	10.3610075	28	.3987197	.0377122
9.6015703	9.9622328	9.6393375	10.3606625	27	.3984297	.0377672
9.6018600	9.9621777	9.6396823	10.3603177	26	.3981400	.0378223
9.6021495	9.9621226	9.6400269	10.3599731	25	.3978505	.0378774
9.6024388	9.9620974	9.6403714	10.3596286	24	.3975612	.0379326
9.6027278	9.9620122	9.6407156	10.3592844	23	.3972722	.0379878
9.6030166	9.9619569	9.6410597	10.3589403	22	.3969834	.0380431
9.6033052	9.9619016	9.6414036	10.3585964	21	.3966948	.0380984
9.6035936	9.9618463	9.6417473	10.3582527	20	.3964064	.0381537
9.6038817	9.9617909	9.6420908	10.3579092	19	.3961183	.0382091
9.6041696	9.9617355	9.6424342	10.3575658	18	.3958304	.0382645
9.6044573	9.9616800	9.6427773	10.3572227	17	.3955427	.0383200
9.6047448	9.9616245	9.6431203	10.356879[illegible]	16	.3952552	.0383755
9.6050320	9.9615689	9.6434631	10.3565369	15	.3949680	.0384311
9.6053190	9.9615133	9.6438057	10.3561943	14	.3946810	.0384867
9.6056057	9.9614576	9.6441481	10.3558519	13	.3943943	.0385424
9.6058923	9.9614020	9.6444903	10.3555097	12	.3941077	.0385980
9.6061786	9.9613463	9.6448324	10.3551676	11	.3938214	.0386538
9.6064647	9.9612904	9.6451743	10.3548257	[illegible]	.3935353	.0387096
9.6067506	9.9612346	9.6455160	10.3544840	9	.3932494	.0387654
9.6070362	9.9611787	9.6458575	10.3541425	8	.3929638	.0388213
9.6073216	9.9611228	9.6461988	10.3538012	7	.3926784	.0388772
9.6076068	9.9610668	9.6465400	10.3534600	6	.3923932	.0389332
9.6078918	9.9610108	9.6468810	10.3531190	5	.3921082	.0389892
9.6081765	9.9609548	9.6472217	10.3527783	4	.3918235	.0390452
9.6084611	9.9608987	9.6475624	10.3524376	3	.3915389	.0391013
9.6087454	9.9608426	9.6479028	10.3520972	2	.3912546	.0391574
9.6090294	9.9607864	9.6482431	10.3517569	1	.3909706	.0392136
9.6093133	9.9607302	9.6485831	10.3514169	0	.3906867	.0392698
Sinus Compl.	SINVS	Tangens Compl.	TANG.	M		

D

M	SINVS.	Sinus Compl.	TANG.	Tangens Compl.		Ar.Com Sinus.	Ar.com Sin.com.
0	9.6093133	9.9607302	9.6485831	10.3514169	60	.3906867	.0392698
1	9.6095969	9.9606739	9.6489230	10.3510770	59	.3904031	.0393261
2	9.6098803	9.9606176	9.6492628	10.3507372	58	.3901197	.0393824
3	9.6101635	9.9605612	9.6496023	10.3503977	57	.3898365	.0394388
4	9.6104465	9.9605048	9.6499417	10.3500583	56	.3895535	.0394952
5	9.6107293	9.9604484	9.6502809	10.3497191	55	.3892707	.0395516
6	9.6110118	9.9603919	9.6506199	10.3493801	54	.3889882	.0396081
7	9.6112941	9.9603354	9.6509587	10.3490413	53	.3887059	.0396646
8	9.6115762	9.9602788	9.6512974	10.3487026	52	.3884238	.0397212
9	9.6118580	9.9602222	9.6516359	10.3483641	51	.3881420	.0397778
10	9.6121397	9.9601655	9.6519742	10.3480258	50	.3878603	.0398345
11	9.6124211	9.9601088	9.6523123	10.3476877	49	3875789	.0398912
12	9.6127023	9.9600520	9.6526503	10.3473497	48	.3872977	.0399480
13	9.6129833	9.9599952	9.6529881	10.3470119	47	.3870167	.0400048
14	9.6132641	9.9599384	9.6533257	10.3466743	46	.3867359	.0400616
15	9.6135446	9.9598815	9.6536631	10.3463369	45	.3864554	.0401185
16	9.6138250	9.9598246	9.6540004	10.3459996	44	.3861750	.0401754
17	9.6141051	9.9597676	9.6543375	10.3456625	43	.3858949	.0402324
18	9.6143850	9.9597106	9.6546744	10.3453256	42	.3856150	.0402894
19	9.6146647	9.9596535	9.6550112	10.3449888	41	.3853353	.0403465
20	9.6149441	9.9595[illegible]4	9.6553477	10.3446523	40	.3850559	.0404036
21	9.6152234	9.9595393	9.6556841	10.3443159	39	.3847766	.0404607
22	9.6155024	9.9594821	9.6560204	10.3439796	38	.3844976	.0405179
23	9.6157812	9.9594248	9.6563564	10.3436436	37	.3842188	.0405752
24	9.6160599	9.9593675	9.6566923	10.3433077	36	.3839401	.0406325
25	9.6163382	9.9593102	9.6570280	10.3429720	35	.3836618	.0406898
26	9.6166164	9.9592528	9.6573636	10.3426364	34	.3833836	.0407472
27	9.6168944	9.9591954	9.6576989	10.3423011	33	.3831056	.0408046
28	9.6171721	9.9591380	9.6580341	10.3419659	32	.3828279	.0408620
29	9.6174496	9.9590805	9.6583692	10.3416308	31	.3825504	.0409195
30	9.6177270	9.9590229	9.6587041	10.3412960	30	.3822730	.0409771
	Sinus Compl.	SINVS.	Tangens Compl.	TANG.	M		

M	SINVS.	Sinus Compl.	TANG.	Tangens Compl.		Ar.com. Sinus.	Ar.com. Sin.com.
0	9.6177270	9.9590229	9.6587041	10.3412960	30	.3822730	.0409771
1	9.6180041	9.9589653	9.6590387	10.3409613	29	.3819959	.0410347
2	9.6182809	9.9589077	9.6593733	10.3406267	28	.3817191	.0410923
3	9.6185576	9.9588500	9.6597076	10.3402924	27	.3814424	.0411500
4	9.6188341	9.9587923	9.6600418	10.3399582	26	.3811659	.0412077
5	9.6191103	9.9587345	9.6603758	10.3396242	25	.3808897	.0412655
6	9.6193864	9.9586767	9.6607097	10.3392903	24	.3806136	.0413233
7	9.6196622	9.9586188	9.6610434	10.3389566	23	.3803378	.0413812
8	9.6199378	9.9585609	9.6613769	10.3386231	22	.3800622	.0414391
9	9.6202132	9.9585030	9.6617103	10.3382897	21	.3797868	.0414970
10	9.6204884	9.9584450	9.6620434	10.3379566	20	.3795116	.0415550
11	9.6207634	9.9583869	9.6623765	10.3376235	19	.3792366	.0416131
12	9.6210382	9.9583288	9.6627093	10.3372907	18	.3789618	.0416712
13	9.6213127	9.9582707	9.6630420	10.3369580	17	.3786873	.0417293
14	9.6215871	9.9582125	9.6633745	10.3366255	16	.3784129	.0417875
15	9.6218612	9.9581543	9.6637069	10.3362931	15	.3781388	.0418457
16	9.6221351	9.9580961	9.6640391	10.3359609	14	.3778649	.0419039
17	9.6224088	9.9580378	9.6643711	10.3356289	13	.3775912	.0419622
18	9.6226824	9.9579794	9.6647030	10.3352970	12	.3773176	.0420206
19	9.6229557	9.9579210	9.6650346	10.3349654	11	.3770443	.0420790
20	9.6232287	9.9578626	9.6653662	10.3346338	10	.3767713	.0421374
21	9.6235016	9.9578041	9.6656975	10.3343025	9	.3764984	.0421959
22	9.6237743	9.9577456	9.6660288	10*3339712	8	.3762257	.0422544
23	9.6240468	9.9576870	9.6663598	10.3336402	7	.3759532	.0423130
24	9.6243190	9.9576284	9.6666907	10.3333093	6	.3759810	.0423716
25	9.6245911	9.9575697	9.6670214	10.3329786	5	.3754089	.0424303
26	9.6248629	9.9575110	9.6673519	10.3326481	4	.3751371	.0424890
27	9.6251346	9.9574522	9.6676823	10.3323177	3	.3748654	.0425478
28	9.6254060	9.9573934	9*6680126	10.3319874	2	.3745940	.042606
29	9.6256772	9.9573346	9.6683426	10.3316574	1	.3743228	.04266[illegible]4
30	9.6259483	9.9572757	9.6686725	10.3313275	0	.3740517	.0427243
	Sinus Compl.	SINVS.	Tangens Compl.	TANG.	M		

M	SINVS.	Sinus Compl.	TANG.	Tangens Compl.		Ar.com. Sinus.	Ar.com. Sin.com.
0	9.6259483	9.9572757	9.6686725	10.3313275	60	.3740517	.0427243
1	9.6262191	9.9572168	9.6690023	10.3309977	59	.3737809	.0427832
2	9.6264897	9.9571578	9.6693319	10.3306681	58	.3735103	.0428422
3	9.6267601	9.9570988	9.6696613	10.3303387	57	.3732399	.0429012
4	9.6270303	9.9570397	9.6699906	10.3300094	56	.3729697	.0429603
5	9.6273003	9.9569806	9.6703197	10.3296803	55	.3726997	.0430194
6	9.6275701	9.9569215	9.6706486	10.3293514	54	.3724299	.0430785
7	9.6278397	9.9568623	9.6709774	10.3290226	53	.3721603	.0431377
8	9.6281090	9.9568030	9.6713060	10.3286940	52	.3718910	.0431970
9	9.6283782	9.9567437	9.6716345	10.3283655	51	.3716218	.0432563
10	9.6286472	9.9566844	9.6719628	10.3280372	50	.3713528	.0433156
11	9.6289160	9.9566250	9.6722910	10.3277090	49	.3710840	.0433750
12	9.6291845	9.9565656	9.6726190	10.3273810	48	.3708155	.0434344
13	9.6294529	9.9565061	9.6729468	10.3270532	47	.3705471	.0434939
14	9.6297211	9.9564466	9.6732745	10.3267255	46	.3702789	.0435534
15	9.6299890	9.9563870	9.6736020	10.3263980	45	.3700110	.0436130
16	9.6302568	9.9563274	9.6739294	10.3260706	44	.3697432	.0436726
17	9.6305243	9.9562678	9.6742566	10.3257434	43	.3694757	.0437322
18	9.6307917	9.9562081	9.6745836	10.3254164	42	.3692083	.0437919
19	9.6310589	9.9561483	9.6749105	10.3250895	41	.3689411	.0438517
20	9.6313258	9.9560886	9.6752372	10.3247628	40	.3686742	.0439114
21	9.6315926	9.9560287	9.6755638	10.3244362	39	.3684074	.0439713
22	9.6318591	9.9559689	9.6758903	10.3241097	38	.3681409	.0440311
23	9.6321255	9.9559089	9.6762165	10.3237835	37	.3678745	.0440911
24	9.6323916	9.9558490	9.6765426	10.3234574	36	.3676084	.0441510
25	9.6326576	9.9557890	9.6768686	10.3231314	35	.3673424	.0442110
26	9.6329233	9.9557289	9.6771944	10.3228056	34	.3670767	.0442711
27	9.6331889	9.9556688	9.6775201	10.3224799	33	.3668111	.0443312
28	9.6334542	9.9556087	9.6778456	10.3221544	32	.3665458	.0443913
29	9.6337194	9.9555485	9.6781709	10.3218291	31	.3662806	.04445[illegible]
30	9.6339844	9.9554882	9.6784961	10.3215039	30	.3660156	.044[illegible]
	Sinus. Compl.	SINVS.	Tangens Compl.	TANG.	M		

M	SINVS.	Sinus. Compl.	TANG.	Tangens Compl.		Ar.com. Sinus.	Ar.com. Sin.com.
30	9,6339844	9.9554882	9,6784961	10.3215039	30	.3660156	.0445118
31	9,6342491	9.9554280	9,6788211	10,3211789	29	.3657509	.0445720
32	9,6345137	9.9553676	9,6791460	10,3208540	28	.3654863	.0446324
33	9,6347780	9.9553073	9,6794708	10,3205292	27	.3652220	.0446927
34	9,6350422	9.9552469	9,6797953	10,3202047	56	.3649578	.0447531
35	9,6353062	9.9551864	9,6801198	10,3198802	25	.3646938	.0448136
36	9,6355699	9.9551259	9,6804440	10,3195560	24	.3644301	.0448741
37	9,6358335	9.9550653	9,6807682	10,3192318	23	.3641665	.0449347
38	9,6360969	9.9550047	9,6810921	10,3189079	22	.3639031	.0449953
39	9,6363601	9.9549441	9,6814160	10,3185840	21	.3636399	.0450559
40	9,6366231	9.9548834	9,6817396	10,3182604	20	.3633769	.0451166
41	9,6368859	9.9548227	9,6820632	10,3179368	19	.3631141	.0451773
42	9,6371484	9.9547619	9,6823865	10,3176135	18	.3628516	.0452381
43	9,6374108	9.9547011	9,6827098	10,3172902	17	.3625892	.0452989
44	9,6376731	9.9546402	9,6830328	10,3169672	16	.3623269	.0453598
45	9,6379351	9.9545793	9,6833557	10,3166433	15	.3620649	.0454207
46	9,6381969	9.9545184	9.6836785	10,3163215	14	.3618032	.0454816
47	9,6384585	9.9544574	9.6840011	10,3159989	13	.3615415	.0455426
48	9,6387199	9.9543963	9.6843236	10,3156764	12	.3612801	.0456037
49	9,6389812	9.9543352	9.6846459	10,3153541	11	.3610188	.0456648
50	9,6392422	9.9542741	9.6849681	10,3150319	10	.3607578	.0457259
51	9,6395030	9.9542129	9.6852901	10,3147099	9	.3604970	.0457871
52	9,6397637	9.9541517	9,6856120	10,3143880	8	.3602363	.0458483
53	9,6400241	9.9540904	9.6859338	10,3140662	7	.3599759	.0459096
54	9,6402844	9.9540291	9.6862553	10,3137447	6	.3597156	.0459709
55	9,6405445	9.9539677	9.6865768	10,3134232	5	.3594555	.0460323
56	9,6408044	9.9539063	9.6868981	10,3131019	4	.3591956	.0460937
57	9,6410640	9.9538448	9.6872192	10,3127808	3	.3589360	.0461552
58	9,6413235	9.9537833	9.6875402	10,3124598	2	.3586765	.0462167
59	9,6415828	9.9537218	9.6878611	10,3121389	1	.3584172	.0462782
60	9,6418420	9.9536602	9.6881818	10,3118182	0	.3581580	.0463398
	Sinus. Compl.	SINVS.	Tangens. Compl.	TANG.	M		

M	SINVS.	Sinus. Compl.	TANG.	Tangens Compl.		Ar.com. Sinus.	Ar.com. Sin.com.
0	9.6418420	9.9536602	9.6881818	10.3118182	60	.3581580	.0463398
1	9.6421009	9.9535985	9.6885023	10.3114977	59	.3578991	.0464015
2	9.6423596	9.9535369	9.6888227	10.3111773	58	.3576404	.0464631
3	9.6426182	9.9534751	9.6891430	10.3108570	57	.3573818	.0465249
4	9.6428765	9.9534134	9.6894631	10.3105369	56	.3571235	.0465866
5	9.6431347	9.9533515	9.6897831	10.3102169	55	.3568653	.0466485
6	9.6433926	9.9532897	9.6901030	10.3098970	54	.3566074	.0467103
7	9.6436504	9.9532278	9.6904226	10.3095774	53	.3563496	.0467722
8	9.6439080	9.9531658	9.6907422	10.3092578	52	.3560920	.0468342
9	9.6441654	9.9531038	9.6910616	10.3089384	51	.3558346	.0468962
10	9.6444226	9.9530418	9.6913809	10.3086191	50	.3555774	.0469582
11	9.6446796	9.9529797	9.6917000	10.3083000	49	.3553204	.0470203
12	9.6449365	9.9529175	9.6920189	10.3079811	48	.3550635	.0470825
13	9.6451931	9.9528553	9.6923378	10.3076622	47	.3548069	.0471447
14	9.6454496	9.9527931	9.6926565	10.3073435	46	.3545504	.0472069
15	9.6457058	9.9527308	9.6929750	10.3070250	45	.3542942	.0472692
16	9.6459619	9.9526685	9.6932934	10.3067066	44	.3540381	.0473315
17	9.6462178	9.9526061	9.6936117	10.3063883	43	.3537822	.0473939
18	9.6464735	9.9525437	9.6939298	10.3060702	42	.3535265	.0474563
19	9.6467290	9.9524813	9.6942478	10.3057522	41	.3532710	.0475187
20	9.6469844	9.9524188	9.6945656	10.3054344	40	.3530156	.0475812
21	9.6472395	9.9523562	9.6948833	10.3051167	39	.3527605	.0476438
22	9.6474945	9.9522936	9.6952009	10.3047991	38	.3525055	.0477064
23	9.6477492	9.9522310	9.6955183	10.3044817	37	.3522508	.0477690
24	9.6480038	9.9521683	9.6958355	10.3041645	36	.3519962	.0478317
25	9.6482582	9.9521055	9.6961527	10.3038473	35	.3517418	.0478945
26	9.6485124	9.9520428	9.6964697	10.3035303	34	.3514876	.0479572
27	9.6487665	9.9519799	9.6967865	10.3032135	33	.3512335	.0480201
28	9.6490203	9.9519171	9.6971032	10.3028968	32	.3509797	.0480829
29	9.6492740	9.9518541	9.6974198	10.3025802	31	.3507260	.0481459
30	9.6495274	9.9517912	9.6977363	10.3022637	30	.3504726	.0482088
	Sinus. Compl.	SINVS.	Tangens. Compl.	TANG.	M		

26 grad.

SINVS.	Sinus Compl.	TANG.	Tangens, Compl.		Ar.com. Sinus.	Ar.com. Sin com.
9.6495274	9.9517912	9.6977363	10.3022637	30	.3504726	.0482088
9.6497807	9.9517282	9.6980526	10.3019474	29	.3502193	.0482718
9.6500338	9.9516651	9.6983687	10.3016313	28	.3499662	.0483349
9.6502868	9.9516020	9.6986847	10.3013153	27	.3497132	.0483980
9.6505395	9.9515389	9.6990006	10.3009994	56	.3494605	.0484611
9.6507920	9.9514757	9.6993164	10.3006836	25	.3492080	.0485243
9.6510444	9.9514124	9.6996320	10.3003680	24	.3489556	.0485876
9.6512966	9.9513492	9.6999474	10.3000526	23	.3487034	.0486508
9.6515486	9.9512858	9.7002628	10.2997372	22	.3484514	.0487142
9.6518004	9.9512224	9.7005780	10.2994220	21	.3481996	.0487776
9.6520521	9.9511590	9.7008930	10.2991070	20	.3479479	.0488410
9.6523035	9.9510956	9.7012080	10.2987920	19	.3476965	.0489044
9.6525548	9.9510320	9.7015227	10.2984773	18	.3474452	.0489680
9.6528059	9.9509685	9.7018374	10.2981626	17	.3471941	.0490315
9.6530568	9.9509049	9.7021519	10.2978481	16	.3469432	.0490951
9.6533075	9.9508412	9.7024663	10.2975337	15	.3466925	.0491588
9.6535581	9.9507775	9.7027805	10.2972195	14	.3464419	.0492225
9.6538084	9.9507138	9.7030946	10.2969054	13	.3461916	.0492862
9.6540586	9.9506500	9.7034086	10.2965914	12	.3459414	.0493500
9.6543086	9.9505861	9.7037225	10.2962775	11	.3456914	.0494139
9.6545584	9.9505223	9.7040362	10.2959638	10	.3454416	.0494777
9.6548081	9.9504583	9.7043497	10.2956503	9	.3451919	.0495417
9.6550575	9.9503944	9.7046632	10.2953368	8	.3449425	.0496056
9.6553068	9.9503303	9.7049765	10.2950235	7	.3446932	.0496697
9.6555559	9.9502663	9.7052897	10.2947103	6	.3444441	.0497337
9.6558048	9.9502022	9.7056027	10.2943973	5	.3441952	.0497978
9.6560536	9.9501380	9.7059156	10.2940844	4	.3439464	.0498620
9.6563021	9.9500738	9.7062284	10.2937716	3	.3436979	.0499262
9.6565505	9.9500095	9.7065410	10.2934590	2	.3434495	.0499905
9.6567987	9.9499452	9.7068535	10.2931465	1	.3432013	.0500548
9.6570468	9.9498809	9.7071659	10.2928341	0	.3429532	.0501191
Sinus Compl.	SINVS.	Tangens Compl.	TANG.	M		

63 grad.

M	SINVS.	Sinus Compl.	TANG.	Tangens, Compl.		Ar.com. Sinus.	Ar.com, Sin com
0	9.6570468	9.9498809	9.7071659	10,2928341	60	.3429532	,0501191
1	9.6572946	9.9498165	9.7074781	10,2925219	59	.3427054	.0501835
2	9.6575423	9.9497521	9.7077902	10,2922098	58	.3424577	.0502479
3	9.6577898	9.9496876	9.7081022	10,2918978	57	.3422102	.0503124
4	9.6580371	9.9496230	9.7084141	10,2915859	56	.3419629	.0503770
5	9.6582842	9.9495585	9.7087258	10,2912742	55	.3417158	.0504415
6	9.6585312	9.9494938	9.7090374	10,2909626	54	.3414688	.0505062
7	9.6587780	9.9494292	9.7093488	10,2906512	53	.3412220	.0505708
8	9.6590246	9.9493645	9.7096601	10,2903399	52	.3409754	.0506355
9	9.6592710	9.9492997	9.7099713	10,2900287	51	.3407290	.0507003
10	9.6595173	9.9492349	9.7102824	10,2897176	50	.3404827	.0507651
11	9.6597634	9.9491700	9.7105933	10,2894067	49	.3402367	.0508300
12	9.6600093	9.9491051	9.7109041	10,2890959	48	.3399907	.0508949
13	9.6602550	9.9490402	9.7112148	10,2887852	47	.3397450	.0509598
14	9.6605005	9.9489752	9.7115254	10,2884746	46	.3394995	.0510248
15	9.6607459	9.9489101	9.7118358	10,2881642	45	.3392541	.0510899
16	9.6609911	9.9488450	9.7121461	10,2878539	44	.3390089	.0511550
17	9.6612361	9.9487799	9.7124562	10,2875438	43	.3387639	.0512201
18	9.6614810	9.9487147	9.7127662	10,2872338	42	.3385190	.0512853
19	9.6617257	9.9486495	9.7130761	10,2869239	41	.3382743	.0513505
20	9.6610702	9.9485842	9.7133859	10,2866141	40	.3380298	.0514158
21	9.6622145	9.9485189	9.7136956	10,2863044	39	.3377855	.0514311
22	9.6624586	9.9484535	9.7140051	10,2859949	38	.3375414	.0515465
23	9.6627026	9.9483881	9.7143145	10,2856855	37	.3372974	.0516119
24	9.6629464	9.9483227	9.7146237	10,2853763	36	.3370536	.0516773
25	9.6631900	9.9482572	9.7149329	10,2850671	35	.3368100	.0517428
26	9.6634335	9.9481916	9.7152419	10,2847581	34	.3365665	.0518084
27	9.6636768	9.9481260	9.7155508	10,2844492	33	.3363232	.0518740
28	9.6639199	9.9480604	9.7158595	10,2841405	32	.3360801	.0519396
29	9.6641628	9.9479947	9.7161682	10,2838318	31	.3358372	.0520053
30	9.6644056	9.9479289	9.7164767	10,2835233	30	.3355944	.0520711
	Sinus Compl.	SINVS.	Tangens Compl.	TANG.	M		

SINVS.	Sinus. Compl.	TANG.	Tangens Compl.		Ar.com. Sinus.	Ar. com. Sin.com.
9,6644056	9.9479289	9.7164767	10,2835233	30	.3355944	,0520711
9,6646482	9.9478631	9.7167851	10,2832149	29	.3353518	,0521369
9,6648906	9.9477973	9.7170933	10,2829067	28	.3351094	,0522027
9,6651329	9.9477314	9.7174014	10,2825986	27	.3348671	,0522686
9,6653749	9.9476655	9.7177094	10,2822906	26	.3346251	,0523345
9,6656168	9.9475995	9.7180173	10,2819827	25	.3343832	.0524005
9,6658586	9.9475335	9.7183251	10,2816749	24	.3341414	,0524665
9,6661001	9.9474674	9.7186327	10,2813673	23	.3338999	.0525326
9,6663415	9.9474013	9.7189402	10,2810598	22	.3336585	,0525987
9,6665828	9.9473352	9.7192476	10,2807524	21	.3334172	,0526648
9,6668238	9.9472689	9.7195549	10,2804451	20	.3331762	,0527311
9,6670647	9.9472027	9.7198620	10,2801380	19	.3329353	,0527973
9,6673054	9.9471364	9.7201690	10,2798309	18	.3326946	,0528636
9,6675459	9.9470700	9.7204759	10,2795241	17	.3324541	,0529300
9,6677863	9.9470036	9.7207827	10,2792173	16	.3322137	,0529964
9,6680265	9.9469372	9.7210893	10,2789107	15	.3319735	.0530628
9,6682665	9.9468707	9.7213958	10,2786042	14	.3317335	.0531293
9,6685064	9.9468042	9.7217022	10,2782978	13	.3314936	.0531958
9,6687461	9.9467376	9.7220085	10,2779915	12	.3312539	.0532624
9,6689856	9.9466710	9.7223147	10,2776853	11	.3310144	.0533290
9,6692250	9.9466043	9.7226207	10,2773793	10	.3307750	.0533957
9,6694642	9.9465336	9.7229266	10,2770734	9	.3305358	.0534624
9,6697032	9.9464708	9.7232324	10,2767676	8	.3302968	.0535292
9,6699420	9.9464040	9.7235381	10,2764619	7	.3300580	.0535960
9,6701807	9.9463371	9.7238436	10,2761564	6	.3298193	.0536629
9,6704192	9.9462702	9.7241490	10,2758510	5	.3295808	.0537298
9,6706576	9.9462032	9.7244543	10,2755457	4	.3293424	.0537968
9,6708958	9.9461362	9.7247595	10,2752405	3	,3291042	.0538638
9,6711338	9.9460692	9.7250646	10,2749354	2	,3288662	.0539308
9,6713716	9.9460021	9.7253695	10,2746305	1	,3286284	.0539979
9,6716093	9.9469349	9.7256744	10,2743256	0	,3283907	.0530651
Sinus. Compl.	SINVS.	Tangens Comple.	TANG.	M		

M	SINVS.	Sinus. Compl.	TANG.	Tangens Compl.		Ar.com. Sinus.	Ar.com. Sin.com.
0	9.6716093	9.9459349	9.7256744	10.2743256	60	.3283907	.0540651
1	9.6718468	9.9458677	9.7259791	10.2740209	59	.3281532	.0541323
2	9.6720841	9.9458005	9.7262837	10.2737163	58	.3279159	.0541995
3	9.6723213	9.9457332	9.7265881	10.2734119	57	.3276787	.0542668
4	9.6725583	9.9456659	9.7268925	10.2731075	56	.3274417	.0543341
5	9.6727952	9.9455985	9.7271967	10.2728033	55	.3272048	.0544015
6	9.6730319	9.9455310	9.7275008	10.2724992	54	.3269681	.0544690
7	9.6732684	9.9454636	9.7278048	10.2721952	53	.3267316	.0545364
8	9.6735047	9.9453960	9.7281087	10.2718913	52	.3264953	.0546040
9	9.6737409	9.9453285	9.7284124	10.2715876	51	.3262591	.0546715
10	9.6739769	9.9452609	9.7287161	10.2712839	50	.3260231	.0547391
11	9.6742128	9.9451932	9.7290196	10.2709804	49	.3257872	.0548068
12	9.6744485	9.9451255	9.7293230	10.2706770	48	.3255515	.0548745
13	9.6746840	9.9450577	9.7296263	10.2703737	47	.3253160	.0549423
14	9.6749194	9.9449899	9.7299295	10.2700705	46	.3250806	.0550101
15	9.6751546	9.9449220	9.7302325	10.2697675	45	.3248454	.0550780
16	9.6753896	9.9448541	9.7305354	10.2694646	44	.3246104	.0551459
17	9.6756245	9.9447862	9.7308383	10.2691617	43	.3243756	.0552138
18	9.6758592	9.9447182	9.7311410	10.2688590	42	.3241408	.0552818
19	9.6760937	9.9446501	9.7314436	10.2685564	41	.3239063	.0553499
20	9.6763281	9.9445821	9.7317460	10.2682540	40	.3236719	.0554179
21	9.6765623	9.9445139	9.7320484	10.2679516	39	.3234377	.0554861
22	9.6767963	9.9444457	9.7323506	10.2676494	38	.3232037	.0555543
23	9.6770302	9.9443775	9.7326527	10.2673473	37	.3229698	.0556225
24	9.6772640	9.9443092	9.7329547	10.2670453	36	.3227360	.0556908
25	9.6774975	9.9442409	9.7332566	10.2667434	35	.3225025	.0557591
26	9.6777309	9.9441725	9.7335584	10.2664416	34	.3222691	.0558275
27	9.6779642	9.9441041	9.7338601	10.2661399	33	.3220358	.0558959
28	9.6781972	9.9440356	9.7341616	10.2658384	32	.3218028	.0559644
29	9.6784301	9.9439671	9.7344631	10.2655369	31	.3215699	.0560329
30	9.6786629	9.9438985	9.7347644	10.2652356	30	.3213371	.0561015
	Sinus. Compl.	SINVS.	Tangens Comple.	TANG.	M		

28 grad.

SINVS.	Sinus Compl.	TANG.	Tangens Compl.		Ar. com. Sinus.	Ar. Com Sin. com.
9.6786629	9.9438985	9.7347644	10,2652356	30	.3213371	.0561015
9.6788955	9.9438299	9.7350656	10,2649344	29	.3211045	.0561701
9.6791279	9.9437612	9.7353667	10,2646333	28	.3218721	.0562388
9.6793602	9.9436925	9.7356677	10,2643323	27	.3206398	.0563075
9.6795923	9.9436238	9.7359685	10,2640315	26	.3204077	.0563762
9.6798243	9.9435549	9.7362693	10,2637307	25	.3201757	.0564451
9.6800560	9.9434861	9.7365699	10,2634301	24	.3199440	.0565139
9.6802877	9.9434172	9.7368705	10,2631295	23	.3197123	.0565828
9.6805191	9.9433482	9.7371309	10,2628291	22	.3194809	.0566518
9.6807504	9.9432792	9.7374712	10,2625288	21	.3192496	.0567208
9.6809816	9.9432102	9.7377714	10,2622286	20	.3190184	.0567898
9.6812126	9.9431411	9.7380715	10,2619285	19	.3187874	.0568589
9.6814434	9.9430720	9.7383714	10,2616286	18	.3185566	.0569280
9.6816741	9.9430028	9.7386713	10,2613287	17	.3183259	.0569972
9.6819046	9.9429335	9.7389710	10,2610290	16	.3180954	.0570665
9.6821349	9.9428643	9.7392707	10,2607293	15	.3178651	.0571357
9.6823651	9.9427949	9.7395702	10,2604298	14	.3176349	.0572051
9.6825952	9.9427255	9.7398696	10,2601304	13	.3174048	.0572745
9.6828250	9.9426561	9.7401689	10,2598311	12	.3171750	.0573439
9.6830548	9.9425866	9.7404681	10,2595319	11	.3169452	.0574134
9.6832843	9.9425171	9.7407672	10,2592328	10	.3167157	.0574829
9.6835137	9.9424476	9.7410662	10,2589338	9	.3164863	.0575524
9.6837430	9.9423779	9.7413650	10,2586350	8	.3162570	.0576221
9.6839720	9.9423083	9.7416638	10,2583362	7	.3160280	.0576917
9.6842010	9.9422386	9.7419624	10,2580376	6	.3157990	.0577614
9.6844297	9.9421688	9.7422609	10,2577391	5	.3155703	.0578312
9.6846583	9.9420990	9.7425594	10,2574406	4	.3153417	.0579010
9.6848868	9.9420291	9.7428577	10,2571423	3	.3151132	.0579709
9.6851151	9.9419592	9.7431559	10,2568441	2	.3148849	.0580408
9.6853432	9.9418893	9.7434540	10,2565460	1	.3146568	.0581107
9.6855712	9.9418193	9.7437520	10,2562480	0	.3144288	.0581807
SINVS.	Sinus. Compl.	Tangens Compl.	TANG.	M		

61 grad.

M	SINVS.	Sinus Compl.	TANG.	Tangens Compl.		Ar. com. Sinus.	Ar.Com Sin.com.
0	9.6855712	9.9418193	9.7437520	10,2562480	60	.3144288	,0581807
1	9.6857991	9.9417492	9.7440499	10,2559501	59	.3142009	,058250
2	9.6860267	9.9416791	9.7443476	10,2556524	58	.3139733	,058320
3	9.6862542	9.9416090	9.7446453	10,2553547	57	.3137458	,058391
4	9.6864816	9.9415388	9.7449428	10,2550572	56	.3135184	,058461
5	9.6867088	9.9414685	9.7452403	10,2547597	55	.3132912	,058531
6	9.6869359	9.9413982	9.7455376	10,2544624	54	.3130641	,058601
7	9.6871628	9.9413279	9.7458349	10,2541651	53	.3128372	,058672
8	9.6873895	9.9412575	9.7461320	10,2538680	52	.3126105	,058742
9	9.6876161	9.9411871	9.7464290	10,2535710	51	.3123839	,058812
10	9.6878425	9.9411166	9.7467259	10,2532741	50	.3121575	,05888
11	9.6880688	9.9410461	9.7470227	10,2529773	49	.3119312	,058953
12	9.6882949	9.9409755	9.7473194	10,2526806	48	.3117051	,059024
13	9.6885209	9.9409048	9.74[illegible]6160	10,2523840	47	.3114791	,059095
14	9.6887467	9.9408342	9.7479125	10,2520875	46	.3112533	,059165
15	9.6889723	9.9407634	9.7482089	10,2517911	45	.3110277	,059236
16	9.6891978	9.9406927	9.7485052	10,2514948	44	.3108022	,059307
17	9.6894232	9.9406219	9.7488013	10,2511987	43	.3105768	,059378
18	9.6896484	9.9405510	9.7490974	10,2509026	42	.3103516	,059449
19	9.6898734	9.9404801	9.7493934	10,2506066	41	.3101266	,059519
20	9.6900983	9.9404091	9.7496892	10,2503108	40	.3099017	,059590
21	9.6903231	9.9403381	9.7499850	10,2500150	39	.3096769	,059661
22	9.6905476	9.9402670	9.7502806	10,2497194	38	.3094524	,059733
23	9.6907721	9.9401959	9.7505762	10,2494238	37	.3092279	,059804
24	9.6909964	9.9401248	9.7508716	10,2491284	36	.3090036	,059875
25	9.6912205	9.9400535	9.7511669	10,2488331	35	.3087795	,059946
26	9.6914445	9.9399823	9.7514622	10,2485378	34	.3085555	,060017
27	9.6916683	9.9399110	9.7517573	10,2482427	33	.3083317	,060089
28	9.6918919	9.9398396	9.7520523	10,2479477	32	.3081081	,060160
29	9.6921155	9.9397682	9.7523472	10,2476528	31	.3078845	,060231
30	9.6923388	9.9396968	9.7526420	10,2473580	30	.3076612	,060303
	SINVS.	Sinus. Compl.	Tangens Compl.	TANG.	M		

29 grad.

SINVS.	Sinus. Compl.	TANG.	Tangens Compl.		Ar.com. Sinus.	Ar.com. Sin.com.
9.6923388	9.9396968	9.7526420	10,2473580	30	.3076612	.0603032
9.6925620	9.9396253	9.7529368	10,2470632	29	.3074380	.0603747
9.6927851	9.9395537	9.7532314	10,2467686	28	.3072149	.0604463
9.6930080	9.9394821	9.7535259	10,2464741	27	.3069920	.0605179
9.6932308	9.9394105	9.7538203	10,2461797	26	.3067692	.0605895
9.6934534	9.9393388	9.7541146	10,2458854	25	.3065466	.0606612
9.6936758	9.9392671	9.7544088	10,2455912	24	.3063242	.0607329
9.6938981	9.9391953	9.7547029	10,2452971	23	.3061019	.0608047
9.6941203	9.9391234	9.7549969	10,2450031	22	.3058797	.0608766
9.6943423	9.9390515	9.7552908	10,2447092	21	.3056577	.0609485
9.6945642	9.9389796	9.7555846	10,2444154	20	.3054358	.0610204
9.6947859	9.9389076	9.7558783	10,2441217	19	.3052141	.0610924
9.6950074	9.9388356	9.7561718	10,2438282	18	.3049926	.0611644
9.6952288	9.9387635	9.7564653	10,2435347	17	.3047712	.0612365
9.6954501	9.9386914	9.7567587	10,2432413	16	.3045499	.0613086
9.6956712	9.9386192	9.7570520	10,2429480	15	.3043288	.0613808
9.6958922	9.9385470	9.7573452	10,2426548	14	.3041078	.0614530
9.6961130	9.9384747	9.7576383	10,2423617	13	.3038870	.0615253
9.6963336	9.9384024	9.7579313	10,2420687	12	.3036664	.0615976
9.6965541	9.9383300	9.7582242	10,2417758	11	.3034456	.0616700
9.6967745	9.9382576	9.7585170	10,2414830	10	.3032255	.0617424
9.6969947	9.9381851	9.7588096	10,2411904	9	.3030053	.0618149
9.6972148	9.9381126	9.7591022	10,2408978	8	.3027852	.0618874
9.6974347	9.9380400	9.7593947	10,2406053	7	.3025653	.0619600
9.6976545	9.9379674	9.7596871	10,2403129	6	.3023455	.0620326
9.6978741	9.9378947	9.7599794	10,2400206	5	.3021250	.0621053
9.6980936	9.9378220	9.7602716	10,2397284	4	.3019064	.0621780
9.6983129	9.9377492	9.7605637	10,2394363	3	.3016871	.0622508
9.6985321	9.9376764	9.7608557	10,2391443	2	.3014679	.0623236
9.6987511	9.9376035	9.7611476	10,2388524	1	.3012489	.0623965
9.6989700	9.9375306	9.7614394	10,2385606	0	.3010300	.0624694
Sinus. Compl.	SINVS.	Tangens Compl.	TANG.	M		

60 grad.

30 grad.

M	SINVS.	Sinus. Compl.	TANG.	Tangens Compl.		Ar.com. Sinus.	Ar.com Sin.com
0	9.6989700	9.9375306	9.7614394	10.2385606	60	.3010300	.0624694
1	9.6991887	9.9374577	9.7617311	10.2382689	59	.3008113	.0625423
2	9.6994073	9.9373847	9.7620227	10.2379773	58	.3005927	.0626153
3	9.6996258	9.9373116	9.7623142	10.2376858	57	.3003742	.0626884
4	9.6998441	9.9372385	9.7626056	10.2373944	56	.3001559	.0627615
5	9.7000622	9.9371653	9.7628969	10.2371031	55	.2999378	.0628347
6	9.7002802	9.9370921	9.7631881	10.2368119	54	.2997198	.0629079
7	9.7004981	9.9370189	9.7634792	10.2365208	53	.2995019	.0629811
8	9.7007158	9.9369456	9.7637702	10.2362298	52	.2992842	.0630544
9	9.7009334	9.9368722	9.7640612	10.2359388	51	.2990666	.0631278
10	9.7011508	9.9367988	9.7643520	10.2356480	50	.2988492	.0632012
11	9.7013681	9.9367254	9.7646427	10.2353573	49	.2986319	.0632746
12	9.7015852	9.9366519	9.7649334	10.2350666	48	.2984148	.0633481
13	9.7018022	9.9365783	9.7652239	10.2347761	47	.2981978	.0634217
14	9.7020190	9.9365047	9.7655143	10.2344857	46	.2979810	.0634953
15	9.7022357	9.9364311	9.7658047	10.2341953	45	.2977643	.0635689
16	9.7024523	9.9363574	9.7660949	10.2339051	44	.2975477	.0636426
17	9.7026687	9.9362836	9.7663851	10.2336149	43	.2973313	.0637164
18	9.7028849	9.9362098	9.7666751	10.2333249	42	.2971151	.0637902
19	9.7031011	9.9361360	9.7669651	10.2330349	41	.2968989	.0638640
20	9.7033170	9.9360621	9.7672550	10.2327450	40	.2966830	.0639379
21	9.7035329	9.9359881	9.7675448	10.2324552	39	.2964671	.0640119
22	9.7037486	9.9359141	9.7678344	10.2321656	38	.2962514	.0640859
23	9.7039641	9.9358401	9.7681240	10.2318760	37	.2960359	.0641599
24	9.7041795	9.9357660	9.7684135	10.2315865	36	.2958205	.0642340
25	9.7043947	9.9356918	9.7687029	10.2312971	35	.2956053	.0643082
26	9.7046099	9.9356177	9.7689922	10.2310078	34	.2953901	.0643823
27	9.7048248	9.9355434	9.7692814	10.2307186	33	.2951752	.0644566
28	9.7050397	9.9354691	9.7695705	10.2304295	32	.2949603	.0645309
29	9.7052543	9.9353948	9.7698596	10.2301404	31	.2947457	.0646052
30	9.7054689	9.9353204	9.7701485	10.2298515	30	.2945311	.0646796
	Sinus. Compl.	SINVS.	Tangens Compl.	TANG.	M		

59 grad.

30 grad.

SINVS.	Sinus Compl.	TANG.	Tangens. Compl.		Ar.com Sinus	Ar.com. Sin.com.
9.7054689	9.9353204	9.7701485	10,2298515	30	.2945311	.0646796
9.7056833	9.9352459	9.7704373	10,2295627	29	.2943167	.0647541
9.7058975	9.9351715	9.7707261	10,2292739	28	.2941025	.0648285
9.7061116	9.9350969	9.7710147	10,2289853	27	.2938884	.0649031
9.7063256	9.9350223	9.7713033	10,2286967	26	.2936744	.0649777
9.7065394	9.9349477	9.7715917	10,2284083	25	.2934606	.0650523
9.7067531	9.9348730	9.7718801	10,2281199	24	.2932469	.0651270
9.7069667	9.9347983	9.7721684	10,2278316	23	.2930333	.0652017
9.7071801	9.9347235	9.7724566	10,2275434	22	.2928199	.0652765
9.7073933	9.9346486	9.7727447	10,2272553	21	.2926067	.0653514
9.7076064	9.9345738	9.7730327	10,2269673	20	.2923936	.0654262
9.7078194	9.9344988	9.7733206	10,2266794	19	.2921806	.0655012
9.7080323	9.9344238	9.7736084	10,2263916	18	.2919677	.0655762
9.7082450	9.9343488	9.7738961	10,2261039	17	.2917550	.0656512
9.7084575	9.9342737	9.7741838	10,2258162	16	.2915425	.0657263
9.7086699	9.9341986	9.7744713	10,2255287	15	.2913301	.0658014
9.7088822	9.9341234	9.7747588	10,2252412	14	.2911178	.0658766
9.7090943	9.9340482	9.7750462	10,2249538	13	.2909057	.0659518
9.7093063	9.9339729	9.7753334	10,2246666	12	.2906937	.0660271
9.7095182	9.9338976	9.7756206	10,2243794	11	.2904818	.0661024
9.7097299	9.9338222	9.7759077	10,2240923	10	.2902701	.0661778
9.7099415	9.9337467	9.7761947	10,2238053	9	.2900585	.0662533
9.7101529	9.9336713	9.7764816	10,2235184	8	.2898471	.0663287
9.7103642	9.9335957	9.7767685	10,2232315	7	.2896358	.0664043
9.7105753	9.9335201	9.7770552	10,2229448	6	.2894247	.0664799
9.7107863	9.9334445	9.7773418	10,2226582	5	.2892137	.0665555
9.7109972	9.9333688	9.7776284	10,2223716	4	.2890028	.0666312
9.7112080	9.9332931	9.7779149	10,2220851	3	.2887920	.0667069
9.7114186	9.9332173	9.7782012	10,2217988	2	.2885814	.0667827
9.7116290	9.9331415	9.7784875	10,2215125	1	.2883710	.0668585
9.7118393	9.9330656	9.7787737	10,2212263	0	.2881607	.0669344
Sinus Compl.	SNVS.	Tangens Compl.	TANG.	M		

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M	SINVS.	Sinus Compl.	TANG.	Tangens. Compl.		Ar.com Sinus	Ar.com. Sin.com.
0	9.7118393	9.9330656	9.7787737	10,2212263	60	,2881605	,0669344
1	9.7120495	9.9329897	9.7790599	10,2209401	59	,2879505	,0670103
2	9.7122596	9.9329137	9.7793459	10,2206541	58	,2877404	,0670863
3	9.7124695	9.9328376	9.7796318	10,2203682	57	,2875305	,0671624
4	9.7126792	9.9327616	9.7799177	10,2200823	56	,2873208	,0672384
5	9.7128889	9.9326854	9.7808234	10,2197966	55	,2871111	,0673146
6	9.7130983	9.9326092	9.7804891	10,2195109	54	,2869017	,0673908
7	9.7133077	9.9325330	9.7807747	10,2192253	53	,2866923	,0674670
8	9.7135169	9.9324567	9.7810602	10,2189398	52	,2864831	,0675433
9	9.7137260	9.9323804	9.7813456	10,2186544	51	,2862740	,0676196
10	9.7139349	9.9323040	9.7816309	10,2183691	50	,2860651	,0676960
11	9.7141437	9.9322276	9.7819162	10,2180838	49	,2858563	.0677724
12	9.7143524	9.9321511	9.7822013	10,2177987	48	,2856476	,0678489
13	9.7145609	9.9320746	9.7824864	10,2175136	47	,2854391	,0679254
14	9.7147693	9.9319980	9.7827713	10,2172287	46	,2852307	,0680020
15	9.7149776	9.9319213	9.7830562	10,2169438	45	,2850224	,0680787
16	9.7151857	9.9318447	9.7833410	10,2166590	44	,2848143	,0681553
17	9.7153937	9.9317679	9.7836258	10,2163742	43	,2846063	,0682321
18	9.7156015	9.9316911	9.7839104	10,2160896	42	,2843985	,0683089
19	9.7158092	9.9316143	9.7841949	10,2158051	41	,2841908	,0683857
20	9.7160168	9.9315374	9.7844794	10,2155206	40	,2839832	,0684626
21	9.7162243	9.9314605	9.7847638	10,2152362	39	,2837757	,0685395
22	9.7164316	9.9313835	9.7850481	10,2149519	38	,2835684	,068616
23	9.7166387	9.9313065	9.7853323	10,2146677	37	,2833613	,068693
24	9.7168458	9.9312294	9.7856164	10,2143836	36	,2831542	,068770
25	9.7170526	9.9311522	9.7859004	10,2140996	35	,2829474	,068847
26	9.7172594	9.9310750	9.7861844	10,2138156	34	,2827406	,068925
27	9.7174660	9.9309978	9.7864682	10,2135318	33	,2825340	,069002
28	9.7176725	9.9309205	9.7867520	10,2132480	32	,2823275	,069079
29	9.7178789	9.9308432	9.7870357	10,2129643	31	,2821211	,069156
30	9.7180851	9.9307658	9.7873193	10,2126807	30	,2819149	,069234
	Sinus Compl.	SINVS.	Tangens Compl.	TANG.	M		

SINVS.	Sinus. Compl.	TANG.	Tangens Compl.		Ar.com. Sinus.	Ar.com. Sin.com.
9,7180851	9.9307658	9.7873193	10,2126807	30	.2819149	.0692342
9,7182912	9.9306883	9.7876028	10,2123972	29	.2817088	.069311[illegible]
9,7184971	9.9306109	9.7878863	10,2121137	28	.2815029	.069389
9,7187030	9.9305333	9.7881696	10,2118304	27	.2812970	.0694667
9,7189086	9.9304557	9.7884529	10,2115471	26	.2810914	.0695443
9,7191142	9.9303781	9.7887361	10,2112639	25	.2808858	.0696219
9,7193196	9.9303004	9.7890192	10,2109808	24	.2806804	.0696996
9,7195249	9.9302226	9.7893023	10,2106977	23	.2804751	.0697774
9,7197300	9.9301448	9.7895852	10,2104148	22	.2802700	.0698552
9,7199350	9.9300670	9.7898681	10,2101319	21	.2800650	.0699330
9,7201399	9.9299891	9.7901508	10,2098492	20	.2798601	.0700109
9,7203447	9.9299112	9.7904335	10,2095665	19	.2796553	.0700888
9,7205493	9.9298332	9.7907161	10,2092839	18	.2794507	.0701668
9,7207538	9.9297551	9.7909987	10,2090013	17	.2792462	.0702449
9,7209581	9,9296770	9.7912811	10,2087189	16	.2790419	.0703230
9,7211623	9.9295989	9.7915635	10,2084365	15	.2788377	.0704011
9,7213664	9.9295207	9.7918458	10,2081542	14	.2786336	.0704793
9,7215704	9.9294424	9.7921280	10,2078720	13	.2784296	.0705576
9,7217742	9.9293641	9.7924101	10,2075899	12	.2782258	.0706359
9,7219779	9.9292857	9.7926921	10,2073079	11	.2780221	.0707143
9,7221814	9.9292073	9.7929741	10,2070259	10	.2778186	.0707927
9,7223848	9.9291289	9.7932560	10,2067440	9	.2776152	.0708711
9,7225881	9.9290504	9.7935378	10,2064622	8	.2774119	.0709496
9,7227913	9.9289718	9.7938195	10,2061805	7	.2772087	.0710282
9,7229943	9.9288932	9.7941011	10,2058989	6	.2770057	.0711068
9,7231972	9.9288145	9.7943827	10,2056173	5	.2768028	.0711855
9,7234000	9.9287358	9.7946641	10,2053359	4	.2766000	.0712642
9,7236026	9.9286571	9.7949455	10,2050545	3	.2763974	.0713429
9,7238051	9.9285783	9.7952268	10,2047732	2	.2761949	.0714217
9,7240075	9.9284994	9.7955081	10,2044919	1	.2759925	.0715006
9,7242097	9.9284205	9.7957892	10,2042108	0	.2757903	.0715795
Sinus. Compl.	SINVS.	Tangens Compl.	TANG.	M		

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M	SINVS.	Sinus. Compl.	TANG.	Tangens Compl.		Ar.com. Sinus.	Ar.com. Sin.com.
0	9.7242097	9.9284205	9.7957892	10.2042108	60	.2757903	.0715795
1	9.7244118	9.92834[illegible]5	9.7960703	10.2039297	59	.2755882	.0716585
2	9.7246138	9.9282625	9.7963513	10.2036487	58	.2753862	.0717375
3	9.7248156	9.9281834	9.7966322	10.2033678	57	.2751844	.0718166
4	9.7250174	9.9281043	9.7969130	10.2030870	56	.2749826	.0718957
5	9.7252189	9.9280251	9.7971938	10.2028062	55	.2747811	.0719749
6	9.7254204	9.9279459	9.7974745	10.2025255	54	.2745796	.0720541
7	9.7256217	9.9278666	9.7977551	10.2022449	53	.2743783	.0721334
8	9.7258229	9.9277873	9.7980356	10.2019644	52	.2741771	.0722127
9	9.7260240	9.9277079	9.7983160	10.2016840	51	.2739760	.0722921
10	9.7262249	9.9276285	9.7985964	10.2014036	50	.2737751	.0723715
11	9.7264257	9.9275490	9.7988767	10.2011233	49	.2735743	.0724510
12	9.7266264	9.9274695	9.7991569	10.2008431	48	.2733736	.0725305
13	9.7268269	9.9273899	9.7994370	10.2005630	47	.2731731	.0726101
14	9.7270273	9.9273103	9.7997170	10.2002830	46	.2729727	.0726897
15	9.7272276	9.9272306	9.7999970	10.2000030	45	.2727724	.0727694
16	9.7274278	9.9271509	9.8002769	10.1997231	44	.2725722	.0728491
17	9.7276278	9.9270711	9.8005567	10.1994433	43	.2723722	.0729289
18	9.7278277	9.9269913	9.8008365	10.1991635	42	.2721723	.0730087
19	9.7280275	9.9269114	9.8011161	10.1988839	41	.2719725	.0730886
20	9.7282271	9.9268314	9.8013957	10.1986043	40	.2717729	.0731686
21	9.7284267	9.9267514	9.8016752	10.1983248	39	.2715733	.0732486
22	9.7286260	9.9266714	9.8019546	10.1980454	38	.2713740	.0733286
23	9.7288253	9.9265913	9.8022340	10.1977660	37	.2711747	.0734087
24	9.7290244	9.9265112	9.8025133	10.1974867	36	.2709756	.0734888
25	9.7292234	9.9264310	9.8027925	10.1972075	35	.2707766	.0735690
26	9.7294223	9.9263507	9.8030716	10.1969284	34	.2705777	.0736493
27	9.7296211	9.9262704	9.8033506	10.1966494	33	.2703790	.0737296
28	9.7298197	9.9261901	9.8036296	10.1963704	32	.2701803	.0738099
29	9.7300182	9.9261096	9.8039085	10.1960915	31	.2699818	.0738904
30	9.7302165	9.9260292	9.8041873	10.1958127	30	.2697835	.0739708
	Sinus. Compl.	SINVS.	Tangens Compl.	TANG.	M		

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M	SINVS.	Sinus Compl.	TANG.	Tangens Compl.		Ar.Com Sinus.	Ar.com. Sin.com.
30	9.7302165	9.9260292	9.8041873	10,1958127	30	.2697835	.0739708
31	9.7304148	9.9259487	9.8044661	10,1955339	29	.2695852	.0740513
32	9.7306129	9.9258681	9.8047447	10,1952553	28	.2693871	.0741319
33	9.7308109	9.9257875	9.8050233	10,1949767	27	.2691891	.0742125
34	9.7310087	9.9257069	9.8053019	10,1946981	26	.2689913	.0742931
35	9.7312064	9.9256261	9.8055803	10,1944197	25	.2687936	.0743739
36	9.7314040	9.9255454	9.8058587	10,1941413	24	.2685960	.0744546
37	9.7316015	9.9254646	9.8061370	10,1938630	23	.2683985	.0745354
38	9.7317989	9.9253837	9.8064152	10,1935848	22	.2682011	.0746163
39	9.7319961	9.9253028	9.8066933	10,1933067	21	.2680039	.0746972
40	9.7321932	9.9252218	9.8069714	10,1930286	20	.2678068	.0747782
41	9.7323902	9.9251408	9.8072494	10,1927506	19	.2676098	.0748592
42	9.7325870	9.9250597	9.8075273	10,1924727	18	.2674130	.0749403
43	9.7327837	9.9249786	9.8078052	10,1921948	17	.2672163	.0750214
44	9.7329803	9.9248974	9.8080829	10,1919171	16	.2670197	.0751026
45	9.7331768	9.9248161	9.8083606	10,1916394	15	.2668232	.0751839
46	9.7333731	9.9247349	9.8086383	10,1913617	14	.2666269	.0752651
47	9.7335693	9.9246535	9.8089158	10,1910842	13	.2664307	.0753465
48	9.7337654	9.9245721	9.8091933	10,1908067	12	.2662346	.0754279
49	9.7339614	9.9244907	9.8094707	10,1905293	11	.2660386	.0755093
50	9.7341572	9.9244092	9.8097480	10,1902520	10	.2658428	.0755908
51	9.7343529	9.9243277	9.8100253	10,1899747	9	.2656471	.0756723
52	9.7345485	9.9242461	9.8103025	10,1896975	8	.2654515	.0757539
53	9.7347440	9.9241644	9.8105796	10,1894204	7	.2652560	.0758356
54	9.7349393	9.9240827	9.8108566	10,1891434	6	.2650607	.0759173
55	9.7351345	9.9240010	9.8111336	10,1888664	5	.2648655	.0759990
56	9.7353296	9.9239191	9.8114105	10,1885895	4	.2646704	.0760809
57	9.7355246	9.9238373	9.8116873	10,1883127	3	.2644754	.0761627
58	9.7357195	9.9237554	9.8119641	10,1880359	2	.2642805	.0762446
59	9.7359142	9.9236734	9.8122408	10,1877592	1	.2640858	.0763266
60	9.7361088	9.9235914	9.8125174	10,1874826	0	.2638912	.0764086
	Sinus Compl.	SINVS	Tangens Compl.	TANG.	M		

M	SINVS.	Sinus Compl.	TANG.	Tangens Compl.		Ar.Com Sinus.	Ar.com: Sin.com.
0	9.7361088	9.9235914	9.8125174	10,1874826	60	.2638912	.0764086
1	9.7363032	9.9235093	9.8127939	10,1872061	59	.2636968	.0764907
2	9.7364976	9.9234272	9.8130704	10,1869296	58	.2635024	.0765728
3	9.7366918	9.9233450	9.8133468	10,1866532	57	.2633082	.0766550
4	9.7368859	9.9232628	9.8136231	10,1863769	56	.2631141	.0767372
5	9.7370799	9.9231805	9.8138993	10,1861007	55	.2629201	.0768195
6	9.7372737	9.9230982	9.8141755	10,1858245	54	.2627263	.0769018
7	9.7374675	9.9230158	9.8144516	10,1855484	53	.2625325	.0769842
8	9.7376611	9.9229334	9.8147277	10,1852723	52	.2623389	.0770666
9	9.7378546	9.9228509	9.8150036	10,1849964	51	.2621454	.0771491
10	9.7380479	9.9227684	9.8152795	10,1847205	50	.2619521	.0772316
11	9.7382412	9.9226858	9.8155554	10,1844446	49	.2617588	.0773142
12	9.7384343	9.9226032	9.8158311	10,1841689	48	.2615657	.0773969
13	9.7386273	9.9225205	9.8161068	10,1838932	47	.2613727	.0774795
14	9.7388201	9.9224377	9.8163824	10,1836176	46	.2611799	.0775623
15	9.7390129	9.9223549	9.8166580	10,1833420	45	.2609871	.0776451
16	9.7392055	9.9222721	9.8169335	10,1830665	44	.2607945	.0777279
17	9.7393980	9.9221891	9.8172089	10,1827911	43	.2606020	.0778109
18	9.7395904	9.9221062	9.8174842	10,1825158	42	.2604096	.0778938
19	9.7397827	9.9220232	9.8177595	10,1822405	41	.2602173	.0779768
20	9.7399748	9.9219401	9.8180347	10,1819653	40	.2600252	.0780599
21	9.7401668	9.9218570	9.8183098	10,1816902	39	.2598332	.0781430
22	9.7403587	9.9217738	9.8185849	10,1814151	38	.2596413	.0782262
23	9.7405505	9.9216906	9.8188599	10,1811401	37	.2594495	.0783094
24	9.7407421	9.9216073	9.8191348	10,1808652	36	.2592579	.0783927
25	9.7409337	9.9215240	9.8194096	10,1805904	35	.2590663	.0784760
26	9.7411251	9.9214406	9.8196844	10,1803156	34	.2588749	.0785594
27	9.7413164	9.9213572	9.8199592	10,1800408	33	.2586836	.0786428
28	9.7415075	9.9212737	9.8202338	10,1797662	32	.2584925	.0787263
29	9.7416986	9.9211902	9.8205084	10,1794916	31	.2583014	.0788098
30	9.7418895	9.9211066	9.8207829	10,1792171	30	.2581105	.0788934
	Sinus Compl.	SINVS.	Tangens Compl.	TANG.	M		

M	SINVS.	Sinus Compl.	TANG.	Tangens. Compl.		Ar.com Sinus	Ar.com. Sin.com.
30	9.7418895	9.9211066	9.8207829	10.1792171	30	.2581105	.0788934
31	9.7420803	9.9210229	9.8210574	10.1789426	29	.2579197	.0789771
32	9.7422710	9.9209393	9.8213317	10.1786683	28	.2577290	.0790607
33	9.7424616	9.9208555	9.8216060	10.1783940	27	.2575384	.0791445
34	9.7426520	9.9207717	9.8218803	10.1781197	26	.2573480	.0792283
35	9.7428423	9.9206878	9.8221545	10.1778455	25	.2571577	.0793122
36	9.7430325	9.9206039	9.8224286	10.1775714	24	.2569675	.0793961
37	9.7432226	9.9205200	9.8227026	10.1772974	23	.2567774	.0794800
38	9.7434126	9.9204360	9.8229766	10.1770234	22	.2565874	.0795640
39	9.7436024	9.9203519	9.8232505	10.1767495	21	.2563976	.0796481
40	9.7437921	9.9202678	9.8235244	10.1764756	20	.2562079	.0797322
41	9.7439817	9.9201836	9.8237981	10.1762019	19	.2560183	.0798164
42	9.7441712	9.9200994	9.8240719	10.1759281	18	.2558288	.0799006
43	9.7443606	9.9200151	9.8243455	10.1756545	17	.2556394	.0799849
44	9.7445498	9.9199308	9.8246191	10.1753809	16	.2554502	.0800692
45	9.7447390	9.9198464	9.8248926	10.1751074	15	.2552610	.0801536
46	9.7449280	9.9197619	9.8251660	10.1748340	14	.2550720	.0802381
47	9.7451169	9.9196775	9.8254394	10.1745606	13	.2548831	.0803225
48	9.7453056	9.9195929	9.8257127	10.1742873	12	.2546944	.0804071
49	9.7454943	9.9195083	9.8259860	10.1740140	11	.2545057	.0804917
50	9.7456828	9.9194237	9.8262592	10.1737408	10	.2543172	.0805763
51	9.7458712	9.9193390	9.8265323	10.1734677	9	.2541288	.0806610
52	9.7460595	9.9192542	9.8268053	10.1731947	8	.2539405	.0807458
53	9.7462477	9.9191694	9.8270783	10.1729217	7	.2537523	.0808306
54	9.7464358	9.9190845	9.8273513	10.1726487	6	.2535642	.0809155
55	9.7466237	9.9189996	9.8276241	10.1723759	5	.2533763	.0810004
56	9.7468115	9.9189146	9.8278969	10.1721031	4	.2531885	.0810854
57	9.7469992	9.9188296	9.8281696	10.1718304	3	.2530008	.0811704
58	9.7471868	9.9187445	9.8284423	10.1715577	2	.2528132	.0812555
59	9.7473743	9.9186594	9.8287149	10.1712851	1	.2526257	.0813406
60	9.7475617	9.9185742	9.8289874	10.1710126	0	.2524383	.0814258
	Sinus Compl.	SINVS.	Tangens Compl.	TANG.	M		

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M	SINVS.	Sinus Compl.	TANG.	Tangens. Compl.		Ar.com. Sinus.	Ar.com. Sin.com.
0	9.7475617	9.9185742	9.8289874	10.1710126	60	.2524383	.0814258
1	9.7477489	9.9184890	9.8292599	10.1707401	59	.2522511	.0815110
2	9.7479360	9.9184037	9.8295323	10.1704677	58	.2520640	.0815963
3	9.7481230	9.9183183	9.8298047	10.1701953	57	.2518770	.0816817
4	9.7483099	9.9182329	9.8300769	10.1699231	56	.2516901	.0817671
5	9.7484967	9.9181475	9.8303492	10.1696508	55	.2515033	.0818525
6	9.7486833	9.9180620	9.8306213	10.1693787	54	.2513167	.0819380
7	9.7488698	9.9179764	9.8308934	10.1691066	53	.2511302	.0820236
8	9.7490562	9.9178908	9.8311654	10.1688346	52	.2509438	.0821092
9	9.7492425	9.9178051	9.8314374	10.1685626	51	.2507575	.0821949
10	9.7494287	9.9177194	9.8317093	10.1682907	50	.2505713	.0822806
11	9.7496148	9.9176336	9.8319811	10.1680189	49	.2503852	.0823664
12	9.7498007	9.9175478	9.8322529	10.1677471	48	.2501993	.0824522
13	9.7499866	9.9174619	9.8325246	10.1674754	47	.2500134	.0825381
14	9.7501723	9.9173760	9.8327963	10.1672037	46	.2498277	.0826240
15	9.7503579	9.9172900	9.8330679	10.1669321	45	.2496421	.0827100
16	9.7505434	9.9172040	9.8333394	10.1666606	44	.2494566	.0827960
17	9.7507287	9.9171179	9.8336109	10.1663891	43	.2492713	.0828821
18	9.7509140	9.9170317	9.8338823	10.1661177	42	.2490860	.0829683
19	9.7510991	9.9169455	9.8341536	10.1658464	41	.2489009	.0830545
20	9.7512842	9.9168593	9.8344249	10.1655751	40	.2487158	.0831407
21	9.7514691	9.9167730	9.8346961	10.1653039	39	.2485309	.0832270
22	9.7516538	9.9166866	9.8349673	10.1650327	38	.2483462	.0833134
23	9.7518385	9.9166002	9.8352384	10.1647616	37	.2481615	.0833998
24	9.7520231	9.9165137	9.8355094	10.1644906	36	.2479769	.0834863
25	9.7522075	9.9164272	9.8357804	10.1642196	35	.2477925	.0835728
26	9.7523919	9.9163406	9.8360513	10.1639487	34	.2476081	.0836594
27	9.7525761	9.9162539	9.8363221	10.1636779	33	.2474239	.0837461
28	9.7527602	9.9161673	9.8365929	10.1634071	32	.2472398	.0838327
29	9.7529442	9.9160805	9.8368636	10.1631364	31	.2470558	.0839195
30	9.7531280	9.9159937	9.8371343	10.1628657	30	.2468720	.0840063
	Sinus Compl.	SINVS.	Tangens Compl.	TANG.	M		

55 grad.

M	SINVS.	Sinus. Compl.	TANG.	Tangens Compl.		Ar.com Sinus	Ar.com. Sin.com.
30	9.7531280	9.9159937	9.8371343	10.1628657	30	.2468720	.0840063
31	9.7533118	9.9159069	9.8374049	10.1625951	29	.2466882	.0840931
32	9.7534954	9.9158200	9.8376755	10.1623245	28	.2465046	.0841800
33	9.7536790	9.9157330	9.8379460	10.1620540	27	.2463210	.0842670
34	9.7538624	9.9156460	9.8382164	10.1617836	26	.2461376	.0843540
35	9.7540457	9.9155589	9.8384867	10.1615133	25	.2459543	.0844411
36	9.7542288	9.9154718	9.8387571	10.1612429	24	.2457712	.0845282
37	9.7544119	9.9153846	9.8390273	10.1609727	23	.2455881	.0846154
38	9.7545949	9.9152974	9.8392975	10.1607025	22	.2454051	.0847026
39	9.7547777	9.9152101	9.8395676	10.1604324	21	.2452223	.0847899
40	9.7549604	9.9151228	9.8398377	10.1601623	20	.2450396	.0848772
41	9.7551431	9.9150354	9.8401077	10.1598923	19	.2448569	.0849646
42	9.7553256	9.9149479	9.8403776	10.1596224	18	.2446744	.0850521
43	9.7555080	9.9148604	9.8406475	10.1593525	17	.2444920	.0851396
44	9.7556902	9.9147729	9.8409174	10.1590826	16	.2443098	.0852271
45	9.7558724	9.9146852	9.8411871	10.1588129	15	.2441276	.0853148
46	9.7560544	9.9145976	9.8414569	10.1585431	14	.2439456	.0854024
47	9.7562364	9.9145099	9.8417265	10.1582735	13	.2437636	.0854901
48	9.7564182	9.9144221	9.8419961	10.1580039	12	.2435818	.0855779
49	9.7565999	9.9143342	9.8422657	10.1577343	11	.2434001	.0856658
50	9.7567815	9.9142464	9.8425351	10.1574649	10	.2432185	.0857536
51	9.7569630	9.9141584	9.8428046	10.1571954	9	.2430370	.0858416
52	9.7571444	9.9140704	9.8430739	10.1569261	8	.2428556	.0859296
53	9.7573256	9.9139824	9.8433432	10.1566568	7	.2426744	.0860176
54	9.7575068	9.9138943	9.8436125	10.1563875	6	.2424932	.0861057
55	9.7576878	9.9138061	9.8438817	10.1561183	5	.2423122	.0861939
56	9.7578687	9.9137179	9.8441508	10.1558492	4	.2421313	.0862821
57	9.7580495	9.9136296	9.8444199	10.1555801	3	.2419505	.0863704
58	9.7582302	9.9135413	9.8446889	10.1553111	2	.2417698	.0864587
59	9.7584108	9.9134530	9.8449579	10.1550421	1	.2415892	.0865471
60	9.7585913	9.9133645	9.8452268	10.1547732	0	.2414087	.0866355
	Sinus. Compl.	SINVS	Tangens Comple.	TANG.	M		

35 grad.

M	SINVS.	Sinus. Compl.	TANG.	Tangens Compl.		Ar.com. Sinus.	Ar. com. Sin.com.
0	9.7585913	9.9133645	9.8452268	10.1547732	60	.2414087	.0866355
1	9.7587717	9.9132760	9.8454956	10.1545044	59	.2412283	.0867240
2	9.7589519	9.9131875	9.8457644	10.1542356	58	.2410481	.0868125
3	9.7591321	9.9130989	9.8460332	10.1539668	57	.2408679	.0869011
4	9.7593121	9.9130102	9.8463018	10.1536982	56	.2406879	.0869898
5	9.7594920	9.9129215	9.8465705	10.1534295	55	.2405080	.0870785
6	9.7596718	9.9128328	9.8468390	10.1531610	54	2403282	.0871672
7	9.7598515	9.9127440	9.8471075	10.1528925	53	.2401485	.0872560
8	9.7600311	9.9126551	9.8473760	10.1526240	52	.2399689	.0873449
9	9.7602106	9.9125662	9.8476444	10.1523556	51	.2397894	.0874338
10	9.7603899	9.9124772	9.8479127	10.1520873	50	.2396101	.0875228
11	9.7605692	9.9123882	9.8481810	10.1518190	49	.2394308	.0876118
12	9.7607483	9.9122991	9.8484492	10.1515508	48	.2392517	.0877009
13	9.7609274	9.9122099	9.8487174	10.1512826	47	.2390726	.0877901
14	9.7611063	9.9121207	9.8489855	10.1510145	46	.2388937	.0878793
15	9.7612851	9.9120315	9.8492536	10.1507464	45	.2387149	.0879685
16	9.7614638	9.9119422	9.8495216	10.1504784	44	.2385362	.0880578
17	9.7616424	9.9118528	9.8497896	10.1502104	43	.2383576	.0881472
18	9.7618208	9.9117634	9.8500575	10.1499425	42	.2381792	.0882366
19	9.7619992	9.9116739	9.8503253	10.1496747	41	.2380008	.0883261
20	9.7621775	9.9115844	9.8505931	10.1494069	40	.2378225	.0884156
21	9.7623556	9.9114948	9.8508608	10.1491392	39	.2376444	.0885052
22	9.7625337	9.9114051	9.8511285	10.1488715	38	.2374663	.0885949
23	9.7627116	9.9113155	9.8513961	10.1486039	37	.2372884	.0886845
24	9.7628894	9.9112257	9.8516637	10.1483363	36	.2371106	.0887743
25	9.7630671	9.9111359	9.8519312	10.1480688	35	.2369329	.0888641
26	[illegible].7632447	9.9110460	9.8521987	10.1478013	34	.2367553	.0889540
27	9.7634222	9.9109561	9.8524661	10.1475339	33	.2365778	.0890439
28	9.7635996	9.9108661	9.8527335	10.1472665	32	.2364004	.0891339
29	9.7637769	9.9107761	9.8530008	10.1469992	31	.2362231	.0892239
30	9.7639540	9.9106860	9.8532680	10.1467320	30	.2360460	.0893140
	Sinus. Compl.	SINVS.	Tangens Comple.	TANG.	M		

54 grad.

M	SINVS.	Sinus Compl.	TANG.	Tangens Compl.		Ar.com. Sinus.	Ar.Com Sin.com:
30	9,7639540	9,9106860	9,8532680	10,1467320	30	,2360460	,0893140
31	9,7641311	9,9105959	9,8535352	10,1464648	29	,2358689	,0894041
32	9,7643080	9,9105057	9,8538023	10,1461977	28	,2356920	,0894943
33	9,7644849	9,9104155	9,8540694	10,1459306	27	,2355151	,0895845
34	9,7646616	9,9103251	9,8543365	10,1456635	26	,2353384	,0896749
35	9,7648382	9,9102348	9,8546034	10,1453966	25	,2351618	,0897652
36	9,7650147	9,9101444	9,8548704	10,1451296	24	,2349853	,0898556
37	9,7651911	9,9100539	9,8551372	10,1448628	23	,2348089	,0899461
38	9,7653674	9,9099634	9,8554041	10,1445959	22	,2346326	,0900366
39	9,7655436	9,9098728	9,8556708	10,1443292	21	,2344564	,0901272
40	9,7657197	9,9097821	9,8559376	10,1440624	20	,2342803	,0902179
41	9,7658957	9,9096915	9,8562042	10,1437958	19	,2341043	,0903085
42	9,7660715	9,9096007	9,8564708	10,1435292	18	,2339285	,0903993
43	9,7662473	9,9095099	9,8567374	10,1432626	17	,2337527	,0904901
44	9,7664229	9,9094190	9,8570039	10,1429961	16	,2335771	,0905810
45	9,7665985	9,9093281	9,8572704	10,1427296	15	,2334015	,0906719
46	9,7667739	9,9092371	9,8575368	10,1424632	14	,2332261	,0907629
47	9,7669492	9,9091461	9,8578031	10,1421969	13	,2330508	,0908539
48	9,7671244	9,9090550	9,8580694	10,1419306	12	,2328756	,0909450
49	9,7672996	9,9089639	9,8583357	10,1416643	11	,2327004	,0910361
50	9,7674746	9,9088727	9,8586019	10,1413981	10	,2325254	,0911273
51	9,7676494	9,9087814	9,8588680	10,1411320	9	,2323506	,0912186
52	9,7678242	9,9086901	9,8591341	10,1408659	8	,2321758	,0913099
53	9,7679989	9,9085988	9,8594002	10,1405998	7	,2320011	,0914012
54	9,7681735	9,9085073	9,8596661	10,1403339	6	,2318265	,0914927
55	9,7683480	9,9084159	9,8599321	10,1400679	5	,2316520	,0915841
56	9,7685223	9,9083243	9,8601980	10,1398020	4	,2314777	,0916757
57	9,7686966	9,9082327	9,8604638	10,1395362	3	,2313034	,0917673
58	9,7688707	9,9081411	9,8607296	10,1392704	2	,2311293	,0918589
59	9,7690448	9,9080494	9,8609954	10,1390046	1	,2309552	,0919506
60	9,7692187	9,9079576	9,8612610	10,1387390	0	2307813	,0920424
	SINVS.	Sinus. Compl.	Tangens Compl.	TANG.	M		

36 grad.

M	SINVS.	Sinus Compl.	TANG.	Tangens Compl.		Ar.com. Sinus.	Ar.Com Sin.com.
0	9.7692186	9.9079576	9.8612610	10,1387390	60	,2307813	,0920424
1	9.7693925	9.9078658	9.8615267	10,1384733	59	,2306075	,0921342
2	9.7695662	9.9077740	9.8617923	10,1382077	58	,2304338	,0922260
3	9.7697398	9.9076820	9.8620578	10,1379422	57	,2302602	,0923180
4	9.7699134	9.9075901	9.8623233	10,1376767	56	,2300866	,0924099
5	9.7700868	9.9074980	9.8625887	10,1374113	55	,2299132	,0925020
6	9.7702601	9.9074059	9.8628541	10,1371459	54	,2297399	,0925941
7	9.7704332	9.9073138	9.8631195	10,1368805	53	,2295668	,0926862
8	9.7706063	9.9072216	9.8633848	10,1366152	52	,2293937	,0927784
9	9.7707793	9.9071293	9.8636500	10,1363500	51	,2292207	,0928707
10	9.7709522	9.9070370	9.8639152	10,1360848	50	,2290478	,0929630
11	9.7711249	9.9069446	9.8641803	10,1358197	49	,2288751	,0930554
12	9.7712976	9.9068522	9.8644454	10,1355546	48	,2287024	,0931478
13	9.7714702	9.9067597	9.8647105	10,1352895	47	,2285298	,0932403
14	9.7716426	9.9066671	9.8649755	10,1350245	46	,2283574	,0933329
15	9.7718150	9.9065745	9.8652404	10,1347596	45	,2281850	,0934255
16	9.7719872	9.9064819	9.8655053	10,1344947	44	,2280128	,0935181
17	9.7721593	9.9063892	9.8657702	10,1342298	43	,2278407	,0936108
18	9.7723314	9.9062964	9.8660350	10,1339650	42	,2276686	,0937036
19	9.7725033	9.9062036	9.8662997	10,1337003	41	,2274967	,0937964
20	9.7726751	9.9061107	9.8665644	10,1334356	40	,2273249	,0938893
21	9.7728468	9.9060177	9.8668291	10,1331709	39	,2271532	,0939823
22	9.7730185	9.9059247	9.8670937	10,1329063	38	,2269815	,0940753
23	9.7731900	9.9058317	9.8673583	10,1326417	37	,2268100	,0941683
24	9.7733614	9.9057386	9.8676228	10,1323772	36	,2266386	,0942614
25	9.7735327	9.9056454	9.8678873	10,1321127	35	,2264673	,0943546
26	9.7737039	9.9055522	9.8681517	10,1318483	34	,2262961	,0944478
27	9.7738749	9.9054589	9.8684160	10,1315840	33	,2261251	,0945411
28	9.7740459	9.9053656	9.8686804	10,1313196	32	,2259541	,0946344
29	9.7742168	9.9052722	9.8689446	10,1310554	31	,2257832	,0947278
30	9.7743876	9.9051787	9.8692089	10,1307911	30	,2256124	,0948213
	Sinus. Compl.	Sn NVS.	Tangens Compl.	TANG.	M		

53 grad.

36 grad.

M	SINVS.	Sinus Compl.	TANG.	Tangens Compl.		Ar.com. Sinus.	Ar.com. Sin.com.
30	9.7743876	9.9051787	9.8692089	10,1307911	30	,2256124	,0948213
31	9.7745583	9.9050852	9.8694731	10,1305269	29	,2254417	,0949148
32	9.7747288	9.9049916	9.8697372	10,1302628	28	,2252712	,0950084
33	9.7748993	9.9048980	9.8700013	10,1299987	27	,2251007	,0951020
34	9.7750697	9.9048043	9.8702653	10,1297347	26	,2249303	,0951957
35	9.7752399	9.9047106	9.8705293	10,1294707	25	,2247601	,0952894
36	9.7754101	9.9046168	9.8707933	10,1292067	24	,2245899	,0953832
37	9.7755801	9.9045230	9.8710572	10,1289428	23	,2244199	,0954770
38	9.7753501	9.9044291	9.8713210	10,1286790	22	,2242499	,0955709
39	9.7759199	9.9043351	9.8715848	10,1284152	21	,2240801	,0956649
40	9.7760897	9.9042411	9.8718486	10,1281514	20	,2239103	,0957589
41	9.7762593	9.9041470	9.8721123	10,1278877	19	,2237407	,0958530
42	9.7764289	9.9040529	9.8723759	10,1276240	18	,2235711	,0959471
43	9.7765983	9.9039587	9.8726396	10,1273604	17	,2234017	,0960413
44	9.7767676	9.9038644	9.8729032	10,1270968	16	,2232324	,0961356
45	9.7769369	9.9037701	9.8731668	10,1268332	15	,2230631	,0962299
46	9.7771060	9.9036757	9.8734302	10,1265698	14	,2228940	,0963243
47	9.7772750	9.9035813	9.8736937	10,1263063	13	,2227250	,0964187
48	9.7774439	9.9034868	9.8739571	10,1260429	12	,2225561	,0965132
49	9.7776128	9.9033923	9.8742204	10,1257796	11	,2223872	,0966077
50	9.7777815	9.9032977	9.8744838	10,1255162	10	,2222185	,0967023
51	9.7779501	9.9032031	9.8747470	10,1252530	9	,2220499	,0967969
52	9.7781186	9.9031084	9.8750102	10'1249898	8	,2218814	,0968916
53	9.7782870	9.9030136	9.8752734	10,1247266	7	,2217130	,0969864
54	9.7784553	9.9029188	9.8755365	10,1244635	6	,2215447	,0970812
55	9.7786235	9.9028239	9.8757996	10,1242004	5	,2213765	,0971761
56	9.7787916	9.9027289	9.8760627	10,1239373	4	,2212084	,0972711
57	9.7789596	9.9026339	9.8763257	10,1236743	3	,2210404	,0973661
58	9.7791275	9.9025389	9'8765886	10,1234114	2	,2208725	,0974611
59	9.7792953	9.9024438	9.8768515	10,1231485	1	,2207047	,0975562
60	9.7794630	9.9023486	9.8771144	10,1228856	0	,2205370	,0976514
	Sinus. Compl.	SnNVS.	Tangens Compl.	TANG.	M		

53 grad.

M	SINVS.	Sinus Compl.	TANG.	Tangens Compl.		Ar.com. Sinus.	Ar.com. Sin.com.
0	9.7794630	9.9023486	9.8771144	10.1228856	60	.2205370	.0976514
1	9.7796306	9.9022534	9.8773772	10.1226228	59	.2203694	.0977466
2	9.7797981	9.9021581	9.8776400	10.1223600	58	.2202019	.0978419
3	9.7799655	9.9020628	9.8779027	10.1220973	57	.2200345	.0979372
4	9.7801328	9.9019674	9.8781654	10.1218346	56	.2198672	.0980326
5	9.7803000	9.9018719	9.8784281	10.1215719	55	.2197000	.0981281
6	9.7804671	9.9017764	9.8786907	10.1213093	54	.2195329	.0982236
7	9.7806341	9.9016808	9.8789533	10.1210467	53	.2193659	.0983192
8	9.7808010	9.9015852	9.8792158	10.1207842	52	.2191990	.0984148
9	9.7809677	9.9014895	9.8794782	10.1205218	51	.2190323	.0985105
10	9.7811344	9.9013938	9.8797407	10.1202593	50	.2188656	.0986062
11	9.7813010	9.9012980	9.8800031	10.1199969	49	.2186990	.0987020
12	9.7814675	9.9012021	9.8802654	10.1197346	48	.2185325	.0987979
13	9.7816339	9.9011062	9.8805277	10.1194723	47	.2183661	.0988938
14	9.7818002	9.9010102	9.8807900	10.1192100	46	.2181998	.0989898
15	9.7819664	9.9009142	9.8810522	10.1189478	45	.2180336	.0990858
16	9.7821324	9.9008181	9.8813144	10.1186856	44	.2178676	.0991819
17	9.7822984	9.9007219	9.8815765	10.1184235	43	.2177016	.0992781
18	9.7824643	9.9006257	9.8818386	10.1181614	42	.2175357	.0993743
19	9.7826301	9.9005294	9.8821007	10.1178993	41	.2173699	.0994706
20	9.7827958	9.9004331	9.8823627	10.1176373	40	.2172042	.0995669
21	9.7829614	9.9003367	9.8826246	10.1173754	39	.2170386	.0996633
22	9.7831268	9.9002403	9.8828866	10.1171134	38	.2168732	.0997597
23	9.7832922	9.9001438	9.8831484	10.1168516	37	.2167078	.0998562
24	9.7834575	9.9000472	9.8834103	10.1165897	36	.2165425	.0999528
25	9.7836227	9.8999506	9.8836721	10.1163279	35	.2163773	.1000494
26	9.7837878	9.8998539	9.8839338	10.1160662	34	.2162122	.1001461
27	9.7839528	9.8997572	9.8841956	10.1158044	33	.2160472	.1002428
28	9.7841177	9.8996604	9.8844572	10.1155428	32	.2158823	.1003396
29	9.7842824	9.8995636	9.8847189	10.1152811	31	.2157176	.1004364
30	9.7844471	9.8994667	9.8849805	10.1150195	30	.2155529	.1005333
	Sinus. Compl.	SINVS.	Tangens Compl.	TANG.	M		

37 grad.

M	SINVS.	Sinus Compl.	TANG.	Tangens, Compl.		Ar.com. Sinus.	Ar.com. Sin com.
30	9.7844471	9.8994667	9.8849805	10.1150195	30	.2155529	.1005333
31	9.7846117	9.8993697	9.8852420	10.1147580	29	.2153883	.1006303
32	9.7847762	9.8992727	9.8855035	10.1144965	28	.2152238	.1007273
33	9.7849406	9.8991756	9.8857650	10.1142350	27	.2150594	.1008244
34	9.7851049	9.8990784	9.8860264	10.1139736	56	.2148951	.1009216
35	9.7852691	9.8989812	9.8862878	10.1137122	25	.2147309	.1010188
36	9.7854332	9.8988840	9.8865492	10.1134508	24	.2145668	.1011160
37	9.7855972	9.8987867	9.8868105	10.1131895	23	.2144028	.1012133
38	9.7857611	9.8986893	9.8870718	10.1129282	22	.2142389	.1013107
39	9.7859249	9.8985919	9.8873330	10.1126670	21	.2140751	.1014081
40	9.7860886	9.8984944	9.8875942	10.1124058	20	.2139114	.1015056
41	9.7862522	9.8983968	9.8878554	10.1121446	19	.2137478	.1016032
42	9.7864157	9.8982992	9.8881165	10.1118835	18	.2135843	.1017008
43	9.7865791	9.8982015	9.8883775	10.1116225	17	.2134209	.1017985
44	9.7867424	9.8981038	9.8886386	10.1113614	16	.2132576	.1018962
45	9.7869056	9.8980060	9.8888996	10.1111004	15	.2130944	.1019940
46	9.7870687	9.8979082	9.8891605	10.1108395	14	.2129313	.1020918
47	9.7872317	9.8978103	9.8894214	10.1105786	13	.2127683	.1021897
48	9.7873946	9.8977123	9.8896823	10.1103177	12	.2126054	.1022877
49	9.7875574	9.8976143	9.8899432	10.1100568	11	.2124426	.1023857
50	9.7877202	9.8975162	9.8902040	10.1097960	10	.2122798	.1024838
51	9.7878828	9.8974181	9.8904647	10.1095353	9	.2121172	.1025819
52	9.7880453	9.8973199	9.8907254	10.1092746	8	.2119547	.1026801
53	9.7882077	9.8972216	9.8909861	10.1090139	7	.2117923	.1027784
54	9.7883701	9.8971233	9.8912468	10.1087532	6	.2116299	.1028767
55	9.7885323	9.8970249	9.8915074	10.1084926	5	.2114677	.1029751
56	9.7886944	9.8969265	9.8917679	10.1082321	4	.2113056	.1030735
57	9.7888565	9.8968280	9.8920285	10.1079715	3	.2111435	.1031720
58	9.7890184	9.8967294	9.8922890	10.1077110	2	.2109816	.1032706
59	9.7891802	9.8966308	9.8925494	10.1074506	1	.2108198	.1033692
60	9.7893420	9.8965321	9.8928098	10.1071902	0	.2106580	.1034679
	Sinus Compl.	SINVS.	Tangens Compl.	TANG.	M		

52 grad.

38 grad.

M	SINVS.	Sinus Compl.	TANG.	Tangens. Compl.		Ar.com. Sinus.	Ar.com. Sin com.
0	9.7893420	9.8965321	9.8928098	10,1071902	60	,2106580	.1034679
1	9.7895036	9.8964334	9.8930702	10,1069298	59	,2104964	,1035666
2	9.7896652	9.8963346	9.8933306	10,1066694	58	,2103348	.1036654
3	9.7898266	9.8962358	9.8935909	10,1064091	57	,2101734	,1037642
4	9.7899880	9.8961369	9.8938511	10,1061489	56	,2100120	,1038631
5	9.7901493	9.8960379	9.8941114	10,1058886	55	,2098507	,1039621
6	9.7903104	9.8959389	9.8943715	10,1056285	54	,2096896	,1040611
7	9.7904715	9.8958398	9.8946317	10,1053683	53	,2095285	,1041602
8	9.7906325	9.8957406	9.8948918	10,1051082	52	,2093675	,1042594
9	9.7907933	9.8956414	9.8951519	10,1048481	51	,2092067	.1043586
10	9.7909541	9.8955422	9.8954119	10,1045881	50	,2090459	.1044578
11	9.7911148	9.8954429	9.8956719	10,1043281	49	,2088852	.1045572
12	9.7912754	9.8953435	9.8959319	10,1040681	48	,2087246	,1046565
13	9.7914359	9.8952440	9.8961918	10,1038082	47	,2085641	,1047560
14	9.7915963	9.8951445	9.8964517	10,1035483	46	,2084037	.1048555
15	9.7917566	9.8950450	9.8967116	10,1032884	45	,2082434	,1049550
16	9.7919168	9.8949453	9.8969714	10,1030286	44	,2080832	,1050547
17	9.7920769	9.8948457	9.8972312	10,1027688	43	,2079231	.1051543
18	9.7922369	9.8947459	9.8974910	10,1025090	42	,2077631	.1052541
19	9.7923968	9.8946461	9.8977507	10,1022493	41	,2076032	,1053539
20	9.7925566	9.8945463	9.8980104	10,1019896	40	,2074434	,1054537
21	9.7927163	9.8944463	9.8982700	10,1017300	39	,2072837	,1055537
22	9.7928760	9.8943464	9.8985296	10,1014704	38	,2071240	,1056536
23	9.7930355	9.8942463	9.8987892	10,1012108	37	,2069645	,1057537
24	9.7931949	9.8941462	9.8990487	10,1009513	36	,2068051	,1058538
25	9.7933543	9.8940461	9.8993082	10,1006918	35	,2066457	,1059539
26	9.7935135	9.8939458	9.8995677	10,1004323	34	,2064865	.1060542
27	9.7936727	9.8938456	9.8998271	10,1001729	33	,2063273	,1061544
28	9.7938317	9.8937452	9.9000865	10,0999135	32	,2061683	,1062548
29	9.7939907	9.8936448	9.9003459	10,0996541	31	,2060093	,1063552
30	9.7941496	9.8935444	9.9006052	10,0993948	30	,2058504	,1064556
	Sinus Compl.	SINVS.	Tangens Compl.	TANG	M		

51 grad.

38 grad.

M	SINVS.	Sinus. Compl.	TANG.	Tangens Compl.		Ar.com. Sinus.	Ar.com. Sin.com.
30	9.7941496	9.8935444	9.9006052	10.0993948	30	.2058504	.1064556
31	9.7943083	9.8934439	9.9008645	10.0991355	29	.2056917	.1065561
32	9.7944670	9.8933433	9.9011237	10.0988763	28	.2055330	.1066567
33	9.7946256	9.8932426	9.9013830	10.0986170	27	.2053744	.1067574
34	9.7947841	9.8931419	9.9016422	10.0983578	56	.2052159	.1068581
35	9.7949425	9.8930412	9.9019013	10.0980987	25	.2050575	.1069588
36	9.7951008	9.8929404	9.9021604	10.0978396	24	.2048992	.1070596
37	9.7952590	9.8928395	9.9024195	10.0975805	23	.2047410	.1071605
38	9.7954171	9.8927385	9.9026786	10.0973214	22	.2045829	.1072615
39	9.7955751	9.8926375	9.9029376	10.0970624	21	.2044249	.1073625
40	9.7957330	9.8925365	9.9031966	10.0968034	20	.2042670	.1074635
41	9.7958909	9.8924354	9.9034555	10.0965445	19	.2041091	.1075646
42	9.7960486	9.8923342	9.9037144	10.0962856	18	.2039514	.1076658
43	9.7962062	9.8922329	9.9039733	10.0960267	17	.2037938	.1077671
44	9.7963638	9.8921316	9.9042321	10.0957679	16	.2036362	.1078684
45	9.7965212	9.8920303	9.9044910	10.0955090	15	.2034788	.1079697
46	9.7966786	9.8919289	9.9047497	10.0952503	14	.2033214	.1080711
47	9.7968359	9.8918274	9.9050085	10.0949915	13	.2031641	.1081726
48	9.7969930	9.8917258	9.9052672	10.0947328	12	.2030070	.1082742
49	9.7971501	9.8916242	9.9055259	10.0944741	11	.2028499	.1083758
50	9.7973071	9.8915226	9.9057845	10.0942155	10	.2026929	.1084774
51	9.7974640	9.8914208	9.9060431	10.0939569	9	.2025360	.1085792
52	9.7976208	9.8913191	9.9063017	10.0936983	8	.2023792	.1086809
53	9.7977775	9.8912172	9.9065603	10.0934397	7	.2022225	.1087828
54	9.7979341	9.8911153	9.9068188	10.0931812	6	.2020659	.1088847
55	9.7980906	9.8910133	9.9070773	10.0929227	5	.2019094	.1089867
56	9.7982470	9.8909113	9.9073357	10.0926643	4	.2017530	.1090887
57	9.7984034	9.8908092	9.9075941	10.0924059	3	.2015966	.1091908
58	9.7985596	9.8907071	9.9078525	10.0921475	2	.2014404	.1092929
59	9.7987158	9.8906049	9.9081109	10.0918891	1	.2012842	.1093951
60	9.7988718	9.8905026	9.9083692	10.0916308	0	.2011282	.1094974
	Sinus. Compl.	SINVS.	Tangens. Compl.	TANG.	M		

51 grad.

39 grad.

M	SINVS.	Sinus. Compl.	TANG.	Tangens Compl.		Ar.com. Sinus.	Ar.com. Sin.com.
0	9.7988718	9.8905026	9.9083692	10.0916308	60	.2011282	.1094974
1	9.7990278	9.8904003	9.9086275	10.0913725	59	.2009722	.1095997
2	9.7991836	9.8902979	9.9088858	10.0911142	58	.2008164	.1097021
3	9.7993394	9.8901954	9.9091440	10.0908560	57	.2006606	.1098046
4	9.7994951	9.8900929	9.9094022	10.0905978	56	.2005049	.1099071
5	9.7996507	9.8899903	9.9096603	10.0903397	55	.2003493	.1100097
6	9.7998062	9.8898877	9.9099185	10.0900815	54	.2001938	.1101123
7	9.7999616	9.8897850	9.9101766	10.0898234	53	.2000384	.1102150
8	9.8001169	9.8896822	9.9104347	10.0895653	52	.1998831	.1103178
9	9.8002721	9.8895794	9.9106927	10.0893073	51	.1997279	.1104206
10	9.8004272	9.8894765	9.9109507	10.0890493	50	.1995728	.1105235
11	9.8005823	9.8893736	9.9112087	10.0887913	49	.1994177	.1106264
12	9.8007372	9.8892706	9.9114666	10.0885334	48	.1992628	.1107294
13	9.8008921	9.8891675	9.9117245	10.0882755	47	.1991079	.1108325
14	9.8010468	9.8890644	9.9119824	10.0880176	46	.1989532	.1109356
15	9.8012015	9.8889612	9.9122403	10.0877597	45	.1987985	.1110388
16	9.8013561	9.8888580	9.9124981	10.0875019	44	.1986439	.1111420
17	9.8015106	9.8887547	9.9127559	10.0872441	43	.1984894	.1112453
18	9.8016649	9.8886513	9.9130137	10.0869863	42	.1983351	.1113487
19	9.8018192	9.8885479	9.9132714	10.0867286	41	.1981808	.1114521
20	9.8019735	9.8884444	9.9135291	10.0864709	40	.1980265	.1115556
21	9.8021276	9.88834 8	9.9137868	10.0862132	39	.1978724	.1116592
22	9.8022816	9.8882372	9.9140444	10.0859556	38	.1977184	.1117628
23	9.8024355	9.8881335	9.9143020	10.0856980	37	.1975645	.1118665
24	9.8025894	9.8880298	9.9145596	10.0854404	36	.1974106	.1119702
25	9.8027431	9.8879260	9.9148171	10.0851829	35	.1972569	.1120740
26	9.8028968	9.8878221	9.9150747	10.0849253	34	.1971032	.1121779
27	9.8030504	9.8877182	9.9153322	10.0846678	33	.1969496	.1122818
28	9.8032038	9.8876142	9.9155896	10.0844104	32	.1967962	.1123858
29	9.8033572	9.8875102	9.9158471	10.0841529	31	.1966428	.1124898
30	9.8035105	9.8874061	9.9161045	10.0838955	30	.1964895	.1125939
	Sinus. Compl.	SINVS.	Tangens. Compl.	TANG.	M		

50 grad.

39 grad.

M	SINVS.	Sinus Compl.	TANG.	Tangens. Compl.		Ar.com. Sinus.	Ar.com Sin.com.
30	9,8035105	9,8874061	9,9161045	10,0838955	30	.1964895	.1125939
31	9,8036637	9,8873019	9,9163618	10,0836382	29	.1963363	.1126981
32	9,8038168	9,8871977	9,9166192	10,0833808	28	.1961832	.1128023
33	9,8039699	9,8870934	9,9168765	10,0831235	27	.1960301	.1129066
34	9,8041228	9,8869890	9,9171338	10,0828662	26	.1958772	.1130110
35	9,8042757	9,8868846	9,9173911	10,0826089	25	.1957243	.1131154
36	9,8044284	9,8867801	9,9176483	10,0823517	24	.1955716	.1132199
37	9,8045811	9,8866756	9,9179055	10,0820945	23	.1954189	.1133244
38	9,8047336	9,8865710	9,9181627	10,0818373	22	.1952664	.1134290
39	9,8048861	9,8864663	9,9184198	10,0815802	21	.1951139	.1135337
40	9,8050385	9,8863616	9,9186769	10,0813231	20	.1949615	.1136384
41	9,8051908	9,8862568	9,9189340	10,0810660	19	.1948092	.1137432
42	9,8053430	9,8861519	9,9191911	10,0808089	18	.1946570	.1138481
43	9,8054951	9,8860470	9,9194481	10,0805519	17	.1945049	.1139530
44	9,8056472	9,8859420	9,9197051	10,0802949	16	.1943528	.1140580
45	9,8057991	9,8858370	9,9199621	10,0800379	15	.1942009	1141630
46	9,8059510	9,8857319	9,9202191	10,0797809	14	.1940490	.1142681
47	9,8061027	9,8856267	9,9204760	10,0795240	13	.1938973	.1143733
48	9,8062544	9,8855215	9,9207329	10,0792671	12	.1937456	.1144785
49	9,8064060	9,8854162	9,9209898	10,0790102	11	.1935940	.1145838
50	9,8065575	9,8853109	9,9212466	10,0787534	10	.1934425	.1146891
51	9,8067089	9,8852055	9,9215034	10,0784966	9	.1932911	.1147945
52	9,8068602	9,8851000	9,9217602	10,0782398	8	.1931398	.1149000
53	9,8070114	9,8849945	9,9220170	10,0779830	7	.1929886	.1150055
54	9,8071626	9,8848889	9,9222737	10,0777263	6	.1928374	.1151111
55	9,8073136	9,8847832	9,9225304	10,0774696	5	.1926864	.1152168
56	9,8074646	9,8846775	9,9227871	10,0772129	4	.1925354	.1153225
57	9,8076154	9,8845717	9,9230437	10,0769563	3	.1923846	.1154283
58	9,8077662	9,8844659	9,9233004	10,0766996	2	.1922338	.1155341
59	9,8079169	9,8843599	9,9235570	10,0764430	1	.1920831	.1156401
60	9,8080675	9,8842540	9,9238135	10,0761865	0	.1919325	.1157460
	Sinus Compl.	SINVS.	Tangens Compl.	TANG.	M		

50 grad.

40 grad.

M	SINVS.	Sinus. Compl.	TANG.	Tangens Compl.		Ar.com. Sin.com	Ar.com. Sinus.
0	9.8080675	9.8842540	9.9238135	10,0761865	60	,1919325	,1157460
1	9.8082180	9.8841479	9.9240701	10,0759299	59	,1917820	,1158521
2	9.8083684	9.8840418	9.9243266	10,0756734	58	,1916316	,1159582
3	9.8085188	9.8839357	9.9245831	10,0754169	57	,1914812	,1160643
4	9.8086690	9.8838294	9.9248396	10,0751604	56	,1913310	,1161706
5	9.8088192	9.8837232	9.9250960	10,0749040	55	,1911808	,1162768
6	9.8089692	9 8836168	9.9253524	10,0746476	54	,1910308	,1163832
7	9.8091192	9.8835104	9.9256088	10,0743912	53	,1908808	,1164896
8	9.8092691	9.8834039	9.9258652	10,0741348	52	,1907309	,1165961
9	9.8094189	9.8832974	9.9261215	10,0738785	51	,1905811	,1167026
10	9.8095686	9.8831908	9.9263778	10,0736222	50	,1904314	,1168092
11	9.8097182	9.8830841	9.9266341	10,0733659	49	,1902818	,1169159
12	9.8098678	9.8829774	9.9268904	10,0731096	48	,1901322	,1170226
13	9.8100172	9.8828706	9.9271466	10,0728534	47	,1899828	,1171294
14	9.8101666	9.8827638	9.9274028	10,0725972	46	,1898334	,1172362
15	9.8103159	9.8826568	9.9276590	10,0723410	45	,1896841	,1173432
16	9.8104650	9.8825499	9.9279152	10,0720848	44	,1895350	,1174501
17	9.8106141	9.8824428	9.9281713	10,0718287	43	,1893859	,1175572
18	9.8107631	9.8823357	9.9284274	10,0715726	42	,1892369	,1176643
19	9.8109121	9.8822285	9.9286835	10,0713165	41	,1890879	,1177715
20	9.8110609	9.8821213	9.9289396	10,0710604	40	,1889391	,1178787
21	9 8112096	9.8820140	9.9291956	10,0708044	39	,1887904	,1179860
22	9.8113583	9.8819067	9.9294516	10,0705484	38	,1886417	,1180933
23	9.8115069	9.8817992	9.9297076	10,0702924	37	,1884931	,1182008
24	9.8116554	9.8816918	9.9299636	10,0700364	36	,1883446	,1183082
25	9.8118038	9.8815842	9.9302195	10,0697805	35	,1881962	,1184158
26	9.8119521	9.8814766	9.9304755	10,0695245	34	,1880479	,1185234
27	9.8121003	9.8813689	9.9307314	10,0692686	33	,1878997	,1186311
28	9.8122484	9.8812612	9.9309872	10,0690128	32	,1877516	,1187388
29	9.8123965	9.8811534	9.9312431	10,0687569	31	,1876035	,1188466
30	9.8125444	9.8810455	9.9314989	10,0685011	30	,1874556	,1189545
	Sinus. Compl.	SINVS.	Tangens. Compl.	TANG.	M		

49 grad.

40 grad.

M	SINVS.	Sinus. Compl.	TANG.	Tangens Compl.		Ar.com. Sinus.	Ar.com. Sin.com.
30	9.8125444	9.8810455	9.9314989	10.0685011	30	.1874556	.1189545
31	9.8126923	9.8809376	9.9317547	10.0682453	29	.1873077	.1190624
32	9.8128401	9.8808296	9.9320105	10.0679895	28	.1871599	.1191704
33	9.8129878	9.8807215	9.9322662	10.0677338	27	.1870122	.1192785
34	9.8131354	9.8806134	9.9325220	10.0674780	26	.1868646	.1193866
35	9.8132829	9.8805052	9.9327777	10.0672223	25	.1867171	.1194948
	9.8134303	9.8803970	9.9330334	10.0669666	24	.1865697	.1196030
	9.8135777	9.8802887	9.9332890	10.0667110	23	.1864223	.1197113
	9.8137250	9.8801803	9.9335446	10.0664554	22	.1862750	.1198197
	9.8138721	9.8800719	9.9338003	10.0661997	21	.1861279	.1199281
	9.8140192	9.8799634	9.9340559	10.0659441	20	.1859808	.1200366
	9.8141662	9.8798548	9.9343114	10.0656886	19	.1858338	.1201452
	9.8143131	9.8797462	9.9345670	10.0654330	18	.1856869	.1202538
	9.8144600	9.8796375	9.9348225	10.0651775	17	.1855400	.1203625
	9.8146067	9.8795287	9.9350780	10.0649220	16	.1853933	.1204713
	9.8147534	9.8794199	9.9353335	10.0646665	15	.1852466	.1205801
	9.8148999	9.8793110	9.9355889	10.0644111	14	1851001	.1206890
	9.8150465	9.8792021	9.9358444	10.0641556	13	849536	.1207979
	9.8151928	9.8790930	9.9360998	10.0639002	12	1848072	.1209070
	9.8153391	9.8789840	9.9363552	10.0636448	11	.1846609	.1210160
	9.8154854	9.8788748	9.9366105	10.0633895	10	.1845146	.1211252
	9.8156315	9.8787656	9.9368659	10.0631341	9	.1843685	.1212344
	9.8157776	9.8786563	9.9371212	10.0628788	8	.1842224	.1213437
	9.8159235	9.8785470	9.9373765	10.0626235	7	.1840765	.1214530
	9.8160694	9.8784376	9.9376318	10.0623682	6	.1839306	.1215624
	9.8162152	9.8783281	9.9378871	10.0621129	5	.1837848	.1216719
	9.8163609	9.8782186	9.9381423	10.0618577	4	.1836391	.1217814
	9.8165066	9.8781090	9.9383975	10.0616025	3	.1834934	.1218910
	9.8166521	9.8779994	9.9386527	10.0613473	2	.1833479	.1220006
	9.8167975	9.8778896	9.9389079	10.0610921	1	.1832025	.1221104
	9.8169429	9.8777799	9.9391631	10.0608369	0	.1830571	.1222201
	Sinus Compl.	SINVS.	Tangens Compl.	TANG.	M		

49 grad.

M	SINVS.	Sinus. Compl.	TANG.	Tangens Compl.		Ar.com. Sinus.	Ar.com. Sin.com.
0	9.8169429	9.8777799	9.9391631	10,0608369	60	,1830571	,1222201
1	9.8170882	9.8776700	9.9394182	10,0605818	59	,1829118	,1223300
2	9.8172334	9.8775601	9.9396733	10,0603267	58	,1827666	,1224399
3	9.8173785	9.8774501	9.9399284	10,0600716	57	,1826215	,1225499
4	9.8175235	9.8773401	9.9401835	10,0598165	56	,1824765	,1226599
5	9.8176685	9.8772300	9.9404385	10,0595615	55	,1823315	,1227700
6	9.8178133	9.8771198	9.9406936	10,0593064	54	,1821867	,1228802
7	9.8179581	9.8770096	9.9409486	10,0590514	53	,1820419	,1229904
8	9.8181028	9.8768993	9.9412036	10,0587964	52	,1818972	,1231007
9	9.8182474	9.8767889	9.9414585	10,0585415	51	,1817526	,1232111
10	9.8183919	9.8766785	9.9417135	10,0582865	50	,1816081	,1233215
11	9.8185364	9.8765680	9.9419684	10,0580316	49	,1814636	,1234320
12	9.8186807	9.8764574	9.9422233	10,0577767	48	,1813193	,1235426
13	9.8188250	9.8763468	9.9424782	10,0575218	47	,1811750	,1236532
14	9.8189692	9.8762361	9.9427331	10,0572669	46	,1810308	,1237639
15	9.8191133	9.8761253	9.9429879	10,0570121	45	,1808867	,1238747
16	9.8192573	9.8760145	9.9432428	10,0567572	44	,1807427	,1239855
17	9.8194012	9.8759036	9.9434976	10,0565024	43	,1805988	,1240964
18	9.8195450	9.8757927	9.9437524	10,0562476	42	,1804550	,1242073
19	9.8196888	9.8756816	9.9440072	10,0559928	41	,1803112	,1243184
20	9.8198325	9.8755706	9.9442619	10,0557381	40	,1801675	,124429
21	9.8199761	9.8754594	9.9445166	10,0554834	39	,1800239	,124540
22	9.8201196	9.8753482	9.9447714	10,0552286	38	,1798804	,124651
23	9.8202630	9.8752369	9.9450261	10,0549739	37	,1797370	,124763
24	9.8204063	9.8751256	9.9452807	10,0547193	36	1795937	,124874
25	9.8205496	9.8750142	9.9455354	10,0544646	35	,1794504	,124985
26	9.8206927	9.8749027	9.9457900	10,0542100	34	,1793073	,125097
27	9.8208358	9.8747912	9.9460447	10,0539553	33	,1791642	,125208
28	9.8209788	9.8746795	9.9462993	10,0537007	32	,1790212	,125320
29	9.8211217	9.8745679	9.9465539	10,0534461	31	,1788783	,125432
30	9.8212646	9.8744561	9.9468084	10,0531916	30	,1787354	,125543
	SINVS.	Sinus. Compl.	Tangens. Compl.	TANG.	M		

41 grad.

M	SINVS.	Sinus Compl.	TANG.	Tangens Compl.		Ar.com. Sinus.	Ar.com. Sin.com.
30	9.8212646	9.8744561	9.9468084	10.0531916	30	.1787354	.1255439
31	9.8214073	9.8743443	9.9470630	10.0529370	29	.1785927	.1256557
32	9.8215500	9.8742325	9.9473175	10.0526825	28	.1784500	.1257675
33	9.8216926	9.8741205	9.9475720	10.0524280	27	.1783074	.1258795
34	9.8218351	9.8740085	9.9478265	10.0521735	26	.1781649	.1259915
35	9.8219775	9.8738965	9.9480810	10.0519190	25	.1780225	.1261035
36	9.8221198	9.8737844	9.9483355	10.0516645	24	.1778802	.1262156
37	9.8222621	9.8736722	9.9485899	10.0514101	23	.1777379	.1263278
38	9.8224042	9.8735599	9.9488443	10.0511557	22	.1775958	.1264401
39	9.8225463	9.8734476	9.9490987	10.0509013	21	.1774537	.1265524
40	9.8226883	9.8733352	9.9493531	10.0506469	20	.1773117	.1266648
	9.8228302	9.8732227	9.9496075	10.0503925	19	.1771698	.1267773
	9.8229721	9.8731102	9.9498619	10.0501381	18	.1770279	.1268898
	9.8231138	9.8729976	9.9501162	10.0498838	17	.1768862	.1270024
	9.8232555	9.8728849	9.9503705	10.0496295	16	.1767445	.1271151
	9.8233971	9.8727722	9.9506248	10.0493752	15	.1766029	.1272278
	9.8235386	9.8726594	9.9508791	10.0491209	14	.1764614	.1273406
	9.8236800	9.8725466	9.9511334	10.0488666	13	.1763200	.1274534
	9.8238213	9.8724337	9.9513876	10.0486124	12	.1761787	.1275663
	9.8239626	9.8723207	9.9516419	10.0483581	11	.1760374	.1276793
	9.8241037	9.8722076	9.9518961	10.0481039	10	.1758963	.1277924
	9.8242448	9.8720945	9.9521503	10.0478497	9	.1757552	.1279055
	9.8243858	9.8719813	9.9524045	10.0475955	8	.1756142	.1280187
	9.8245267	9.8718681	9.9526587	10.0473413	7	.1754733	.1281319
	9.8246676	9.8717548	9.9529128	10.0470872	6	.1753324	.1282452
	9.8248083	9.8716414	9.9531670	10.0468330	5	.1751917	.1283586
	9.8249490	9.8715279	9.9534211	10.0465789	4	.1750510	.1284721
	9.8250896	9.8714144	9.9536752	10.0463248	3	.1749104	.1285856
	9.8252301	9.8713008	9.9539293	10.0460707	2	.1747699	.1286992
	9.8253705	9.8711872	9.9541834	10.0458166	1	.1746295	.1288128
	9.8255109	9.8710735	9.9544374	10.0455626	0	.1744891	.1289265
	Sinus. Compl.	SINVS.	Tangens Compl.	TANG.	M		

grad. 48

42 grad.

M	SINVS.	Sinus Compl.	TANG.	Tangens Compl.		Ar. com. Sinus.	Ar.Com Sin.com.
0	9.8255109	9.8710735	9.9544374	10,0455626	60	.1744891	.1289265
1	9.8256512	9.8709597	9.9546915	10,0453085	59	.1743488	.1290403
2	9.8257913	9.8708458	9.9549455	10,0450545	58	.1742087	.1291542
3	9.8259314	9.8707319	9.9551995	10,0448005	57	.1740686	.1292681
4	9.8260715	9.8706179	9.9554535	10,0445465	56	.1739285	.1293821
5	9.8262114	9.8705039	9.9557075	10,0442925	55	.1737886	.1294961
6	9.8263512	9.8703898	9.9559615	10,0440385	54	.1736488	.1296102
7	9.8264910	9.8702756	9.9562154	10,0437846	53	.1735090	.1297244
8	9.8266307	9.8701613	9.9564694	10,0435306	52	.1733693	.1298387
9	9.8267703	9.8700470	9.9567233	10,0432767	51	.1732297	.1299530
10	9.8269098	9.8699326	9.9569772	10,0430228	50	.1730902	.1300674
11	9.8270493	9.8698182	9.9572311	10,0427689	49	.1729507	.1301818
12	9.8271887	9.8697037	9.9574850	10,0425150	48	.1728113	.1302963
13	9.8273279	9.8695891	9.9577389	10,0422611	47	.1726721	.1304109
14	9.8274671	9.8694744	9.9579927	10,0420073	46	.1725329	1305256
15	9.8276063	9.8693597	9.9582465	10,0417535	45	.1723937	.1306403
16	9.8277453	9.8692449	9.9585004	10,0414996	44	.1722547	.1307551
17	9.8278843	9.8691301	9.9587542	10,0412458	43	.1721157	.1308699
18	9.8280231	9.8690152	9.9590080	10,0409920	42	.1719769	.1309848
19	9.8281619	9.8689002	9.9592618	10,0407382	41	.1718381	.1310998
20	9.8283006	9.8687851	9.9595155	10,0404845	40	.1716994	.1312149
21	9.8284393	9.3686700	9.9597693	10,0402307	39	.1715607	.1313300
22	9.8285778	9.8685548	9.9600230	10,0399770	38	.1714222	.131445[illegible]
23	9.8287163	9.8684396	9.9602767	10,0397232	37	.1712837	.1315604
24	9.8288547	9.8683242	9.9605305	10,0394695	36	.1711453	.1316758
25	9.8289930	9.8682088	9.9607842	10,0392158	35	.1710070	.1317912
26	9.8291312	9.8680934	9.9610378	10,0389622	34	.1708688	.1319066
27	9.8292694	9.8679779	9.9612915	10,0387085	33	.1707306	.132022[illegible]
28	9.8294075	9.8678623	9.9615452	10,0384548	32	.1705925	.132137[illegible]
29	9.8295454	9.8677466	9.9617988	10,0382012	31	.1704546	.132253[illegible]
30	9.8296833	9.8676309	9.9620525	10,0379475	30	.1703167	.13236[illegible]
	Sinus. Compl.	SINVS.	Tangens Compl.	TANG.	M		

47 grad.

42 grad.

M	SINVS.	Sinus. Compl.	TANG.	Tangens Compl.		Ar.com. Sinus.	Ar. com. Sin. com
30	9.8296833	9.8676309	9.9620525	10,0379475	30	.1703167	.1323691
31	9.8298212	9.8675151	9.9623061	10,0376939	29	.1701788	.1324849
32	9.8299589	9.8673992	9.9625597	10,0374403	28	.1700411	.1326008
33	9.8300966	9.8672833	9.9628133	10,0371867	27	.1699034	.1327167
34	9.8302342	9.8671673	9.9630669	10,0369331	26	.1697658	.1328327
35	9.8303717	9.8670512	9.9633204	10,0366796	25	.1696283	.1329488
36	9.8305091	9.8669351	9.9635740	10,0364260	24	.1694909	.1330649
37	9.8306464	9.8668189	9.9638275	10,0361725	23	.1693536	.1331811
38	9.8307837	9.8667026	9.9640811	10,0359189	22	.1692163	.1332974
39	9.8309209	9.8665863	9.9643346	10,0356654	21	.1690791	.1334137
40	9.8310580	9.8664699	9.9645881	10,0354119	20	.1689420	.1335301
41	9.8311950	9.8663534	9.9648416	10,0351584	19	.1688050	.1336466
43	9.8313320	9.8662369	9.9650951	10,0349049	18	.1686680	.1337631
43	9.8314688	9.8661203	9.9653486	10,0346514	17	.1685312	.1338797
44	9.8316056	9.8660036	9.9656020	10,0343980	16	.1683944	.1339964
45	9.8317423	9.8658868	9.9658555	10,0341445	15	.1682577	.1341132
46	9.8318789	9.8657700	9.9661089	10,0338911	14	.1681211	.1342300
47	9.8320155	9.8656531	9.9663623	10,0336377	13	.1679845	.1343469
48	9.8321519	9.8655362	9.9666157	10,0333843	12	.1678481	.1344638
49	9.8322883	9.8654192	9.9668692	10,0331308	11	.1677117	.1345808
50	9.8324246	9.8653021	9.9671225	10,0328775	10	.1675754	.1346979
51	9.8325609	9.8651849	9.9673759	10,0326241	9	.1674391	.1348151
52	9.8326970	9.8650677	9.9676293	10,0323707	8	.1673030	.1349323
53	9.8328331	9.8649504	9.9678827	10,0321173	7	.1671669	.1350496
54	9.8329691	9.8648331	9.9681360	10,0318640	6	.1670309	.1351669
55	9.8331050	9.8647156	9.9683893	10,0316107	5	.1668950	.1352844
56	9.8332408	9.8645981	9.9686427	10,0313573	4	.1667592	.1354019
57	9.8333766	9.8644806	9.9688960	10,0311040	3	.1666234	.1355194
58	9.8335122	9.8643629	9.9691493	10,0308507	2	.1664878	.1356371
59	9.8336478	9.8642452	9.9694026	10,0305974	1	.1663522	.1357548
60	9.8337833	9.8641275	9.9696559	10,0303441	0	1662167	.1358725
	Sinus. Compl.	SINVS.	Tangens Comple.	TANG.	M		

47 grad.

43 grad.

M	SINVS.	Sinus. Compl.	TANG.	Tangens Compl.		Ar.com. Sinus.	Ar.com. Sin.com.
0	9,8337833	9,8641275	9,9696559	10,0303441	60	,1662167	,1358725
1	9,8339188	9,8640096	9,9699091	10,0300909	59	,1660812	,1359904
2	9,8340541	9,8638917	9,9701624	10,0298376	58	,1659459	,1361083
3	9,8341894	9,8637737	9,9704157	10,0295843	57	,1658106	,1362263
4	9,8343246	9,8636557	9,9706689	10,0293311	56	,1656754	,1363443
5	9,8344597	9,8635376	9,9709221	10,0290779	55	,1655403	,1364624
6	9,8345978	9,8634194	9,9711754	10,0288246	54	,1654052	,1365806
7	9,8347297	9,8633011	9,9714286	10,0285714	53	,1652703	,1366989
8	9,8348646	9,8631828	9,9716818	10,0283182	52	,1651354	,1368172
9	9,8349994	9,8630644	9,9719350	10,0280650	51	,1650006	,1369356
10	9,8351341	9,8629460	9,9721882	10,0278118	50	,1648659	,1370540
11	9,8352688	9,8628274	9,9724413	10,0275587	49	,1647312	,1371726
12	9,8354033	9,8627088	9,9726945	10,0273055	48	,1645967	,1372912
13	9,8355378	9,3625902	9,9729477	10,0270523	47	1644622	,1374098
14	9,8356722	9,8624714	9,9732008	10,0267992	46	,1643278	,1375286
15	9,8358066	9,8623526	9,9734539	10,0265461	45	,1641934	,1376474
16	9,8359408	9,8622338	9,9737071	10,0262929	44	,1640592	,1377662
17	9,8360750	9,8621148	9,9739602	10,0260398	43	,1639250	,1378852
18	9,8362091	9,8619958	9,9742133	10,0257867	42	,1637909	,1380042
19	9,8363431	9,8618767	9,9744664	10,0255336	41	,1636569	,1381233
20	9,8364771	9,8617576	9,9747195	10,0252805	40	,1635229	,1382424
21	9,8366109	9,8616383	9,9749726	10,0250274	39	,1633891	,1383617
22	9,8367447	9,8615190	9,9752257	10,0247743	38	,1632553	,1384810
23	9,8368784	9,8613997	9,9754787	10,0245213	37	,1631216	,1386003
24	9,8370121	9,8612803	9,9757318	10,0242682	36	,1629879	,1387197
25	9,8371456	9,8611608	9,9759849	10,0240151	35	,1628544	,1388392
26	9,8372791	9,8610412	9,9762379	10,0237621	34	,1627209	,1389588
27	9,8374125	9,8609215	9,9764909	10,0235091	33	,1625875	,1390785
28	9,8375458	9,8608018	9,9767440	10,0232560	32	,1624542	,1391982
29	9,8376790	9,8606821	9,9769970	10,0230030	31	,1623210	,1393179
30	9,8378122	9,8605622	9,9772500	10,0227500	30	,1621878	,1394378
	Sinus Compl.	SINVS.	Tangens Compl.	TANG.	M		

46 grad.

43 grad.

M	SINVS.	Sinus. Compl.	TANG.	Tangens Compl.		Ar.com. Sinus.	Ar. com. Sin.com.
30	9.8378122	9.8605622	9.9772500	10.0227500	30	.1621878	.1394378
31	9.8379453	9.8604423	9.9775030	10.0224970	29	.1620547	.1395577
32	9.8380783	9.8603223	9.9777560	10.0222440	28	.1619217	.1396777
33	9.8382112	9.8602022	9.9780090	10.0219910	27	.1617888	.1397978
34	9.8383441	9.8600821	9.9782620	10.0217380	26	.1616559	.1399179
35	9.8384769	9.8599619	9.9785149	10.0214851	25	.1615231	.1400381
36	9.8386096	9.8598416	9.9787679	10.0212321	24	.1613904	.1401584
37	9.8387422	9.8597213	9.9790209	10.0209791	23	.1612578	.1402787
38	9.8388747	9.8596009	9.9792738	10.0207262	22	.1611253	.1403991
39	9.8390072	9.8594804	9.9795268	10.0204732	21	.1609928	.1405196
40	9.8391396	9.8593599	9.9797797	10.0202203	20	.1608604	.1406401
41	9.8392719	9.8592393	9.9800326	10.0199674	19	.1607281	.1407607
42	9.8394041	9.8591186	9.9802856	10.0197144	18	.1605959	.1408814
43	9.8395363	9.8589978	9.9805385	10.0194615	17	.1604637	.1410022
44	9.8396684	9.8588770	9.9807914	10.0192086	16	.1603316	.1411230
45	9.8398004	9.8587561	9.9810443	10.0189557	15	.1601996	.1412439
46	9.8399323	9.8586351	9.9812972	10.0187028	14	.1600677	.1413649
47	9.8400642	9.8585141	9.9815501	10.0184499	13	.1599358	.1414859
48	9.8401959	9.8583929	9.9818030	10.0181970	12	.1598041	.1416071
49	9.8403276	9.8582718	9.9820559	10.0179441	11	.1596724	.1417282
50	9.8404563	9.8581505	9.9823087	10.0176913	10	.1595407	.1418495
51	9.8405908	9.8580292	9.9825616	10.0174384	9	.1594092	.1419708
52	9.8407223	9.8579078	9.9828145	10.0171855	8	.1592777	.1420922
53	9.8408537	9.8577863	9.9830673	10.0169327	7	.1591463	.1422137
54	9.8409850	9.8576648	9.9833202	10.0166798	6	.1590150	.1423352
55	9.8411162	9.8575432	9.9835730	10.0164270	5	.1588838	.1424568
56	9.8412474	9.8574215	9.9838259	10.0161741	4	.1587526	.1425785
57	9.8413785	9.8572998	9.9840787	10.0159213	3	.1586215	.1427002
58	9.8415095	9.8571779	9.9843315	10.0156685	2	.1584905	.1428221
59	9.8416404	9.8570561	9.9845844	10.0154156	1	.1583596	.1429439
60	9.8417713	9.8569341	9.9848372	10.0151628	0	.1582287	.1430659
	Sinus. Compl.	SINVS.	Tangens Comple.	TANG.	M.		

46 grad.

M	SINVS.	Sinus Compl.	TANG.	Tangens. Compl.		Ar.com. Sinus	Ar.com. Sin.com.
0	9.8417713	9.8569341	9.9848372	10,0151628	60	.1582287	.1430659
1	9.8419021	9.8568121	9.9850900	10,0149100	59	.1580979	.1431879
2	9.8420328	9.8566900	9.9853428	10,0146572	58	.1579672	.1433100
3	9.8421634	9.8565678	9.9855956	10,0144044	57	.1578366	.1434322
4	9.8422939	9.8564455	9.9858484	10,0141516	56	.1577061	.1435545
5	9.8424244	9.8563232	9.9861012	10,0138988	55	.1575756	.1436768
6	9.842[illegible]548	9.8562008	9.9863540	10,0136460	54	.1574452	.1437992
7	9.8426851	9.8560784	9.9866068	10,0133932	53	.1573149	.1439216
8	9.8428154	9.8559558	9.9868596	10,0131404	52	.1571846	.1440442
9	9.8429456	9.8558332	9.9871123	10,0128877	51	.1570544	.1441668
10	9.8430757	9.8557106	9.9873651	10,0126349	50	.1569243	.1442894
11	9.8432057	9.8555878	9.9876179	10,0123821	49	.1567943	.1444122
12	9.8433356	9.8554650	9.9878706	10,0121294	48	.1566644	.1445350
13	9.8434655	9.8553421	9.9881234	10,0118766	47	.1565345	.1446579
14	9.8435953	9.8552192	9.9883761	10,0116239	46	.1564047	.1447808
15	9.8437250	9.8550961	9.9886289	10,0113711	45	.1562750	.1449039
16	9.8438547	9.8549730	9.9888816	10,0111184	44	.1561453	.1450270
17	9.8439842	9.8548499	9.9891344	10,0108656	43	.1560158	.1451501
18	9.8441137	9.8547266	9.9893871	10,0106129	42	.1558863	.1452734
19	9.8442432	9.8546033	9.9896399	10,0103601	41	.1557568	.1453967
20	9.8443725	9.8544799	9.9898926	10,0101074	40	.1556275	.1455201
21	9.8445015	9.8543564	9.9901453	10,0098547	39	.1554982	.1456436
22	9.8446310	9.8542329	9.9903981	10,0096019	38	.1553690	.1457671
23	9.8447601	9.8541093	9.9906508	10,0093492	37	.1552399	.1458907
24	9 8448891	9.8539850	9.9909035	10,0090965	36	.1551109	.1460144
25	9.8450181	9.8538619	9.9911562	10,0088438	35	.1549819	.1461381
26	9.8451470	9.8537381	9.9914089	10,0085911	34	1548530	.1462619
27	9.8452758	9.8536142	9.9916616	10,0083384	33	1547242	.1463858
28	9.8454045	9.8534902	9.9919143	10,0080857	32	.1545955	.1465098
26	9.8455332	9.8533662	9.9921670	10,0078330	31	.1544668	.1466338
39	9.8456618	9.8532421	9.9924197	10,0075803	30	.1543382	.1467579
	Sinus. Compl.	SINVS.	Tangens Compl.	TANG.	M		

44 grad.

M	SINVS.	Sinus Compl.	TANG.	Tangens, Compl.		Ar.com, Sinus.	Ar. com, Sin.com.
30	9.8456618	9.853242.	9.9924197	10.0075803	30	.1543382	.1467579
31	9.8457903	9.8531179	9.9926724	10.0073276	29	.1542097	.1468821
32	9.8459188	9.8529936	9.9929251	10.0070749	28	.1540812	.1470064
33	9.8460471	9.8528693	9.9931778	10.0068222	27	.1539529	.1471307
34	9.8461754	9.8527449	9.9934305	10.0065695	26	.1538246	.1472551
35	9.8463036	9.8526204	9.9936832	10.0063168	25	.1536964	.1473796
36	9.8464318	9.8524959	9.9939359	10.0060641	24	.1535682	.1475041
37	9.8465599	9.8523713	9.9941886	10.0058114	23	.1534401	.1476287
38	9.8466879	9.8522466	9.9944413	10.0055587	22	.1533121	.1477534
39	9.8468158	9.8521218	9.9946940	10.0053060	21	.1531842	.1478782
40	9.8469436	9.8519970	9.9949466	10.0050534	20	.1530564	.1480030
41	9.8470714	9.8518721	9.9951993	10.0048007	19	.1529286	.1481279
42	9.8471991	9.8517471	9.9954520	10.0045480	18	.1528009	.1482529
43	9.8473267	9.8516220	9.9957047	10.0042953	17	.1526733	.1483780
44	9.8474543	9.8514969	9.9959573	10.0040427	16	.1525457	.1485031
45	9.8475817	9.8513717	9.9962100	10.0037900	15	.1524183	.1486283
46	9.8477091	9.8512465	9.9964627	10.0035373	14	.1522909	.1487535
47	9.8478365	9.8511211	9.9967154	10.0032846	13	.1521635	.1488789
48	9.8479637	9.8509957	9.9969680	10.0030320	12	.1520363	.1490043
49	9.8480909	9.8508702	9.9972207	10.0027793	11	.1519091	.1491298
50	9.8482180	9.8507446	9.9974734	10.0025266	10	.1517820	.1492554
51	9.8483450	9.8506190	9.9977260	10.0022740	9	.1516550	.1493810
52	9.8484720	9.8504933	9.9989787	10.0020213	8	.1515280	.1495067
53	9.8485989	9.8503675	9.9982314	10.0017686	7	.1514011	.1496325
54	9.8487257	9.8502417	9.9984840	10.0015160	6	.1512743	.1497583
55	9.8488524	9.8501157	9.9987367	10.0012633	5	.1511476	.1498843
56	9.8489791	9.8499897	9.9989893	10.0010107	4	.1510209	.1580103
57	9.8491057	9.8498637	9.9992420	10.0007580	3	.1508943	.1501363
58	9.8492322	9.8497375	9.9994947	10.0005053	2	.1507678	.1502625
59	9.8493586	9.8496113	9.9997473	10.0002527	1	.1506414	.1503887
60	9.8494850	9.8494850	1.0000000	10.0000000	0	.1505150	.1505150
	Sinus Compl.	SINVS.	Tangens Compl.	TANG.	M		

45 grad.